# NURSES' COMPLIANCE IN USING MODIFIED NEONATAL FALL RISK ASSESSMENT SCALE FOR NEWBORNS

**BY**

**REEMA MIRIAM UTHUP**

**A DISSERTATION SUBMITTED TO THE TAMILNADU DR.M.G.R MEDICAL UNIVERSITY, CHENNAI, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF**

**MASTER OF SCIENCE IN NURSING**

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**NURSES' COMPLIANCE IN USING MODIFIED NEONATAL FALL RISK ASSESSMENT SCALE FOR NEWBORNS**

**Approved by the dissertation committee on: _____**

**Research Guide : _____**

**Dr.LathaVenkatesan,**
**M.Sc (N)., M.Phil(N)., Ph.D(N).,**
**M.B.A(HM)., Ph.D(HDFS).,**
Principal cum Professor
Apollo College of Nursing,
Chennai – 600 095.

**Clinical Guide :_____**

**Prof. Nesa Sathya Satchi, M.Sc (N).,**
Head of Department,
Child Health Nursing,
Apollo College of Nursing,
Chennai- 600 095.

**Medical Guide :_____**

**Dr. Meena Thiagarajan,**
**MBBS., DCH., MRCP.,**
**Consultant Neonatologist**
Apollo Cradle Hospital,
Chennai - 600 006.

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## DECLARATION

I hereby declare that the present dissertation entitled **"Nurses' compliance in using Modified Neonatal Fall Risk Assessment Scale for Newborns"** is the outcome of the original research work undertaken and carried out by me under the guidance of **Dr. Latha Venkatesan,** M.Sc(N)., M.Phil (N)., Ph.D(N)., M.B.A., Ph.D **(**HDFS**)**., Principal cum professor, Apollo College of Nursing, and **Prof. Nesa Sathya Satchi,** M.Sc (N)., HOD, Department of Child Health Nursing, Apollo College of Nursing, Chennai. I also declare that the material of this has not found in anyway, the basis for the award of any degree or diploma in this university or any other university.

**Reema Miriam Uthup**

**M.Sc (N) II Year Student**

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## SYNOPSIS

"A Study to Assess the Nurses Compliance in Using Modified Neonatal Fall Risk Assessment Scale for Newborns in Selected Hospitals, Chennai".

**The Objectives of this Study were,**

1. To assess the compliance of nurses in using Modified Neonatal Fall Risk Assessment Scale.
2. To determine the incidence of fall after the implementation of Modified Neonatal Fall Risk Assessment Scale.
3. To find out the association between the compliance of nurses in using Modified Neonatal Fall Risk Assessment Scale and selected demographic variables of Nurses.

The conceptual framework for the study was developed on the basis of Wiedenbach's Helping Art of Clinical Nursing Theory (1964), which was modified for the present study. An intensive review of literature and experts guidance laid the foundation to the development of tools such as demographic variable proforma, obstetrical variable for postnatal mothers, nurses practice compliance check list and nurses attitude rating scale.

In this study a descriptive co-relational research design has been adopted. The present study was conducted in Apollo Cradle Hospital, Chennai among 30 nurses who satisfied the inclusion criteria.

The researcher used the demographic variable proforma to get the baseline information about the nurses. An obstetrical variable proforma for postnatal mothers to get the baseline information about postnatal mothers. An observational

checklist was used to assess the practice of nurses and a rating scale was used to assess the attitude of nurses towards the newborn fall risk assessment scale. The data collection tools were validated and reliability was established. After the pilot study, the data collection for the main study was conducted for a period of six weeks. The collected data was tabulated and analyzed using appropriate descriptive and inferential statistics.

**The Major Findings of the Study**

- ✓ More than half of the nurses were aged 23 – 25 years (53.3%), qualified with BSc (N) (98.3%), majority of them had not attended any in-service education on fall risk prevention or had undergone newborn related certified speciality training (86.6%).
- ✓ More than half of the mothers were aged 21 - 30 years (60%), Primipara (70%). Majority of mothers had a pain score of 4 – 7 on day 1, day 2 and day 3 (80%, 70%, 50 %). Majority of mothers (90%) got analgesics through intravenous route.
- ✓ The compliance of nurses who used modified neonatal fall risk assessment scale for newborns was found to higher on day 3 (80%) among the nurses working in labor ward, OT and postnatal ward and in NICU and nursery all the nurses (100%) were compliant on day 2 and 3.
- ✓ The mean and standard deviation on the compliance of nurses taking care of the newborn was found to be higher on the third day of implementation of modified neonatal fall risk assessment scale for newborns (M =50.1 & SD = 7.68) in comparison with day 1 (M = 34.2 & SD = 9) and day 2 (M = 40 & SD = 7.53) for nurses in labor ward, OT and postnatal ward and it also depicts that for nurses working in NICU and nursery it was higher on day 3 (M = 29.1 & SD = 1.95 ) in comparison with day 1 (M = 23.3 & SD = 3.7) and day 2 (M = 28.2 & SD = 2.8).

- ✓ Findings reveal that there is no incidence of falls after implementation of Modified Neonatal Fall Risk Assessment Scale for Newborns.
- ✓ Chi square test was used for finding out the association between the selected demographic variables and the compliance of nurses in using Modified Neonatal Fall Risk Assessment Scale, it showed no significant association between the nurses compliance and the selected demographic variables on day1, 2, 3. Hence the null hypothesis $H_0$1; There will be no significant association between compliance of nurses using Modified Neonatal Fall Risk Assessment Scale and selected demographic variables of nurses was retained.

**Recommendations**

- ➢ A similar study could be undertaken on a larger scale for a more valid generalization.
- ➢ The present study could be replicated in different settings.
- ➢ A comparative study may be done using different fall risk assessment scales.
- ➢ A study can be conducted to find out the risk factors of newborn fall in the hospital.

## TABLE OF CONTENTS

## LIST OF TABLES

## LIST OF FIGURES

## LIST OF APPENDICES

# CHAPTER-I

# INTRODUCTION

## Background of the Study

***"With every newborn baby a little sun rises"***

***-Irmgard Erath***

The birth of a baby is one of life's most wondrous moments. Infants between birth and the first 28 days of life are called newborn babies or neonates. They truly constitute the foundation of human life. Just as children are not mini adults, neonates are not mini children. Newborn care needs much attention and vigilance. Newborn fall is mostly under researched and unreported due to fear of response from the society ethical and legal issues.

The newborn period is most vulnerable phase of life (Meharban Singh, 2010). The UNICEF (United Nations Children's Emergency Fund), 2013 estimated that averages of 353,000 babies are born each day around the world. The crude birth rate is 18.9 births per 1000 population or 255 births globally per minute or 4.3 births every second. They also mention that our current world population is approximately 7.2 billion and growing. It passed the billion marks in 2011. It is expected to reach between 8 to 10 billion by 2050.

The term neonatal comes from neo, "new" and natal "pertaining to birth or origin" (Harper, 2010). The newborn period is the most vulnerable period in life since the newborns are too young to care for themselves and their safety depends upon the care exercised by of their caretakers for improving the quality of care. As a part of health care, quality and insurance preoccupations and some scoring systems have been developed for adult patients. The first studies about

falling risk were conducted by Morse and Hendrich, and after that, different scoring systems and comparisons of their efficacy have been reported. Unfortunately, there are no scoring systems for evaluating fall risk in children (Abike, 2010).

Joint Commission on Accreditation of Healthcare Organizations, (JACHO) 2010 reports newborns in – hospital falls are at a rate of 1.36 – 4.14/10,000 live births. Standardized evaluation and management guidelines need to be developed to aid the clinician in the appropriate care of newborns experiencing this infrequent event. Interventions to be taken in terms of expanding the patient safety contract, monitoring mothers closely, improving equipment safety, spreading information about newborn fall within the state and throughout the hospital. The staffs should use patient safety contract to improve awareness and for preventing falls. The mothers and close family members should be asked to review the safety information and sign the contract. A few published statistics of hospital fall rates show there are about 600 to 1,600 newborn falls occurring annually. Many of these falls can result in injury or even the death of the newborn (Matteson, 2013).

With the increase in women opting to breastfeed and with a greater emphasis on mother-infant bonding, most babies spend all the hours of their first days in their mother's hospital room. For the most part, this new arrangement is excellent for the well-being of mothers and their babies. Mothers get to spend those critical bonding hours with their newborn and the babies start their lives feeling secure and loved. But a new problem has come up with the shift. Sometimes, when the mother, or another caregiver, is holding the baby, they may unexpectedly fall asleep and drop their baby. In some cases, the baby simply

slides from the caretakers' hands to the floor. Nurses from many institutions around the country have been publicly sharing their experiences and plans to reduce the risk of infant falls. It is a traumatic experience for all involved. Not only can the baby be injured, but parents and nurses are likely being found guilty. While no one is to blame in such instances, there is still a need to send out a strong message to new parents that such falls are preventable. (Robyn, 2015)

The birth process can be long and exhausting. Some women might be in labor for hours and sometimes miss at least one night's sleep. They may get pain medications often, these medications can exacerbate the drowsiness caused from sleep deprivation. The mothers may want to hold the babies after the birth. It is one of the most joyous times of their lives. But, sometimes, the mother may feel sleepy and lose hold of the baby. Also some parents think that the safest place for a baby is in the hospital bed with the mother and can result in falls (Robyn, 2015).

Attention is needed in preventing patient falls in newborns and in obstetric units of hospitals. A majority of prenatal, postpartum, and newborn falls are preventable very little effort has been made to address fall risk during the prenatal period, during labor, and after delivery in the postpartum period for moms and babies. Risk factors for falls in these populations have been identified, and targeted risk assessments and fall prevention interventions have been developed to eliminate these falls. Evidence demonstrates success in reducing falls with a variety of low-cost but high-return initiatives, comprising prenatal education, patient and family engagement, implementation of unique fall risk assessment tools, postpartum mobility assessments, and changes in patient rounding frequency (Gaffey, 2015)

## Need for the Study

The newborn period is the most vulnerable period in life, since the child is totally dependent on the caretaker. Newborn falls are the most under-researched and under-reported incidents, although adults and pediatric patients have various published and standardized tools for assessing the risk of fall. There are only few published fall risk assessment scales for newborns. Neonatal fall resulting from negligence can cause serious injury and sometimes be fatal.

Jagnoor (2011) have analyzed data relating to unintentional injury according to the ongoing Million Death Study from 2001–2003 using verbal autopsy and coding of all deaths in accordance with the International statistical classification of diseases and related health problems, tenth revision, in a nationally representative sample of 1.1 million homes throughout the country. The findings reveal falls accounting for 25% (2003/8023) of deaths due to unintentional injury, being the second leading cause of such deaths. An estimated 160 000 fall-related deaths occurred in India in 2005; of these, nearly 20 000 were in children aged 0–14 years. The unintentional-fall-related mortality rate (MR) per 100 000 population was 14.5 (99% confidence interval, CI: 13.7–15.4). Fall from heights were more common in younger age groups.

Hitchcock (2012), in his case study presented in AWHONN(Association of Women's Health, Obstetric and Neonatal Nurses) describe a newborn fall as a newborn being dropped from the arms of an adult falling asleep (67%), a fall during repositioning or transfer (22%), or a fall in conjunction with another person falling or tripping (11%). Currently, the prevalence of in-hospital newborn falls is 1.6-4.14 falls/10,000 live births. Their facility delivers approximately 3200

babies/year, and the rate of newborn falls in one 13 month period was 11.53 falls/10,000 live births. The reasons for this higher rate are not clear. As per their case study during, 4 infant falls occurred during thirteen month period. Each happened on the Couplet Care unit between midnight and 9am. The mothers involved were all recovering from caesarean sections following a prolonged labor. Of the infants that fell, three were in bed with their mothers, the fourth involved the father.

In the three cases involving the mother, all were holding their newborn, fell asleep, and were awakened by their newborn crying on the floor. In all cases, a support person was present but she too was asleep at the time of the fall. Each case was carefully reviewed by a multidisciplinary team and the literature reviewed. The possible contributing factors for the increase in newborn falls included increased emphasis on “rooming-in”, breastfeeding, and “skin-to-skin”; new beds on the unit which had large side-rail gaps at the elbow level; and deficits in staff awareness and patient education regarding infant fall prevention. Multiple interventions were instituted: Intense parent education was initiated first, with parent education given in a “dosing” fashion, starting in Childbirth Education, then the Labor and Delivery, and Couplet Care units. An “Eyes on Baby” component was added to hourly rounding. Co-sleeping danger signage was placed in every room and the hospital beds changed to an older model with smaller side-rail gaps, Hitchcock (2012).

Maternity units in health care facilitate promote close interaction between families and their newborns to encourage the bonding process. However, injury to newborns may be unintentional happening while in the care of their families soon

after birth. Exhausted family members may not contemplate the possibility of a fall, bump to the head, or other injury occurring while their newborn is placed in their care. Falls are the most common events affecting newborn safety. In – hospital newborn fall rates estimate are 600 to 1600 every year. Many of these falls can result in emotional stress to the family apart from the harm to the newborn (Wallace, 2013).

Data from a multihospital health care system by collected by (Monson, 2008) reveals that the fall of a newborn infant to the hospital floor is an error that has received little or no attention in medical publications. During the study period, 88,774 live births occurred at the Intermountain Healthcare hospitals. Fourteen neonatal in-hospital falls were identified during this period (incidence estimate: 1.6 falls per 10,000 births). Seven falls occurred when a parent, holding the infant in a hospital bed or reclining chair, fell asleep and the infant fell to the floor. Four falls occurred in the delivery room, 2 in the hallway while a nurse was wheeling a bassinette, and 1 from an infant swing. No deaths occurred. One patient sustained a depressed skull fracture and was transported to the regional children's hospital. At hospital discharge, 13 of the 14 were reported to have a normal examination. No specific protocols for preventing in-hospital falls of neonates were in place. If the incidence of a neonatal in-hospital fall in this study is representative, then 600 to 700 such falls occur annually in the United States.

The rate of newborn falls by year in Pennsylvania shows the average length of stay in days for women who have given birth in all United States hospitals as 2.7 days. Of the 272 falls, 85.3% occurred when the newborn was less than four days old. Of these 232 newborn falls, 42.7% occurred on day one and 32.8%

occurred on day two. Pennsylvania Health Care Cost Containment Council suggested that improving the safety of patients should be recognized as a priority in healthcare. Although falls and other injuries are primary concerns for hospitalized adults, there is a lack of studies in literature addressing newborn falls and other injuries that occur while the newborn is in the care of their families, (Susan, 2013).

Magri (2013) mentions the Implementation of a Newborn Safety Partnering Agreement for Parents on the mother–baby unit raises awareness to prevent infant falls and injury. An increased rate of infant falls in the mother–baby unit prompted a review to identify potential contributory factors. An infant safety checklist was developed to include awareness of potential falls. Based on the feedback, a checklist evolved into a Newborn Safety Partnering Agreement for Parents and fall debrief tool to be used after a fall for immediate identification of the contributing factors. The premise behind the partnering agreement was to increase parents' awareness of the potential of an infant fall beyond the traditional patient education. A tool was used to educate and ask parents to partner with the staff in keeping their infant safe. Since the implementation of the Newborn Safety Partnering Agreement for Parents, there has been no infant falls to date. Implementation of a Newborn Safety Partnering Agreement for Parents on the mother–baby unit raises awareness to prevent infant falls and injury.

An integrative review was done by Spoelstra (2012) on fall prevention in hospitals; they retrieved thirteen articles that focused on fall interventions in the hospital setting. Multifactorial fall prevention interventions programs that included fall risk assessments, door/bed/patient fall risk alerts, environmental and

equipment modifications, staff and patient safety education, medication management targeted to specific types, and additional assistance with transfer and toileting demonstrate reduction in both falls and fall injuries in hospitalized patients. Hospitals need to take steps to reduce falls by using multifactorial fall prevention programs using evidence based interventions.

According to National Institute of Public Cooperation and Child Developments resource document on newborn and neonatal care of children, 2016 report around 260 lakh children are born every year in India. As per the census of 2011, the share of children (0 – 6 years) was 13 percent of the total population in the country. An estimated 12.7 lakh children die every year before completing five years of age. However, 81 percent of under- five child mortality takes place within one year of birth accounting for nearly 10.5 lakh infant deaths; while 57 percent of under – five deaths take place within the first one month of life, accounting for 7.3 lakh neonatal deaths every year in the country. On 18 September 2014, an Indian newborn action plan (INAP) was launched in response to the Global Newborn Action Plan. INAP lays out a vision and a plan for India to end preventable newborn deaths, accelerate progress and scale up high – impact yet cost – effective interventions to work towards the attainment of the goals of single digit neonatal mortality rate by 2030.

Post natal women and newborn are at the risk of fall in maternity units. Managing falls in the maternity setting has received minimal attention and has not been well documented. There are many chances of neonatal fall in NICU like while giving a bath to baby or while transferring the baby from one place to another. Fall risk assessment scales are available for adults and children but there

are not many scales to measure and document the babies at risk for fall. Newborns accidental falls are common but are not reported much. It is an under-researched and under-reported issue for organizations that care for newborn patients and there are no scales available to use. Hence the researcher has undertaken this study to prevent newborn fall in hospitals.

## Statement of the Problem

"A Study to Assess the Nurses Compliance in Using Modified Neonatal Fall Risk Assessment Scale for Newborns in Selected Hospitals, Chennai."

## Objectives of the Study

1. To assess the compliance of nurses in using Modified Neonatal Fall Risk Assessment Scale.
2. To determine the incidence of fall after the implementation of Modified Neonatal Fall Risk Assessment Scale.
3. To find out the association between compliance of nurses in using Modified Neonatal Fall Risk Assessment Scale and selected demographic variables of nurses.

## Operational Definitions

**Newborn Fall**

Move from a higher to a lower level typically rapid and without control (Oxford dictionary).

In this study, a fall refers to any physical harm to the child due to carelessness, accidental fall of newborn from the care takers hands due to inappropriate preventive measures.

**Risk Assessment Scale**

Risk assessment scale is the determination of a quantitative or qualitative estimate of risk related to a well defined situation and a recognized threat (Wikipedia).

In this study, risk assessment scale refers to a Neonatal fall risk assessment scale developed by Bayindir hospital which was modified later by the investigator for Apollo Cradle Hospital after simplifying and categorizing it into newborn risk and preventive measures and mother risk factors and preventive measures to assess and prevent newborn falls, it is a checklist with 17 items explaining the various fall risk factors in newborns who are admitted in hospital. It has two options yes/no and all item except 8 and 17 are scored 1and they are scored 3 and 4 respectively.

**Newborn**

A newborn infant or neonate is a child under 28 days of age (World Health Organization).

In this study, newborn is a child under 28 days of age who was admitted in Apollo Cradle Hospital, Chennai.

**Compliance**

The act of doing what you have been asked or ordered to do: the act or the process of complying (Merriam Webster's Learner's dictionary).

It is an adherence to practice by nurses as per guidelines in using Modified Neonatal Fall Risk Assessment Scale as measured using a checklist developed by the investigator.

## Null Hypotheses

$H_0$1; There will be no significant association between compliance of nurses in using Modified Neonatal fall risk assessment scale and selected demographic variables of nurses.

## Assumptions

The study assumes that,

- ✓ Incidence of a newborn fall can be prevented
- ✓ Falls in newborn can be fatal
- ✓ Fall risk assessment scale helps identification of risk factors for falls of newborn.
- ✓ Fall risk assessment scale is effective for proper documentation.
- ✓ Fall risk assessment scale is essential for safe newborn care.

## Delimitations

The study was limited to

- ✓ Nurses working at Apollo Cradle Hospital.
- ✓ Data collection was limited to six weeks

## Conceptual Framework

The conceptual framework for a particular study is the abstract, logical structure that enables the researcher to link the findings to the nursing body of knowledge. Conceptual framework formalizes the thinking process so that others may read and know the framework of reference that is basic to the research

problem. The framework is built from a set of concepts linked to a plan or existing system of methods, behaviors, functions and objectives.

It was developed from an existing theory of interest and proposing relationship among them. The model gives direction for planning research design, data collection and interpretation of findings, ( Polit & Beck, 2012).

The present study aims at the assessment of the compliance of nurses in using fall risk assessment tool for newborns. The framework of the study is based on 'Wiedenbach's Helping Art of Clinical Nursing theory'. Ernestine Wiedenbach's Helping Art of Clinical Nursing theory (1964) describes a defined situation and a way to attain it.

This theory has three factors:

- ✓ Central purpose
- ✓ Prescription
- ✓ Realities

**Central Purpose**

It refers to what the investigator wants to accomplish. It is the overall goal towards which the investigator works. In this study, it refers to eliminate fall risk among newborns.

**Prescription**

It refers to the care plan for the participants under study. It specifies the nature of action that will fulfill the investigator's central purpose. In this study it refers development of a Modified Neonatal Fall Risk Assessment Scale for Newborns.

**Realities**

These refer to the physical, physiological, emotional and spiritual factors that come into play in a situation involving investigator action. The five realities identified by Weidenbach's are agent, recipient, goal, means, activities and framework. In this study these refers to the following:

Agent: researcher

Recipient: who are taking care of newborns

Goal: to prevent newborn fall

Facility: Modified Neonatal Fall Risk Assessment Scale for Newborns

The conceptualization of nursing practice according to this theory consists of three steps

Step I – Identifying the need for help.

Step II– Ministering the needed help.

Step III– Validating that the need for help was met.

**Step I: Identifying the need for help**

This step involves determination of the need for help. In this study the need for helping staff nurses is identified through review of literature, researcher's personal experience, shared experience from other staffs.

**Step II: Ministering the needed help**

Introducing the newborn fall assessment scale to staff nurses for effective management and thus to prevent newborn falls.

**Step III: Validating that the need for help was met**

It is accomplished by means of post assessment of compliance of nurses in using Modified Neonatal Fall Risk Assessment Scale.

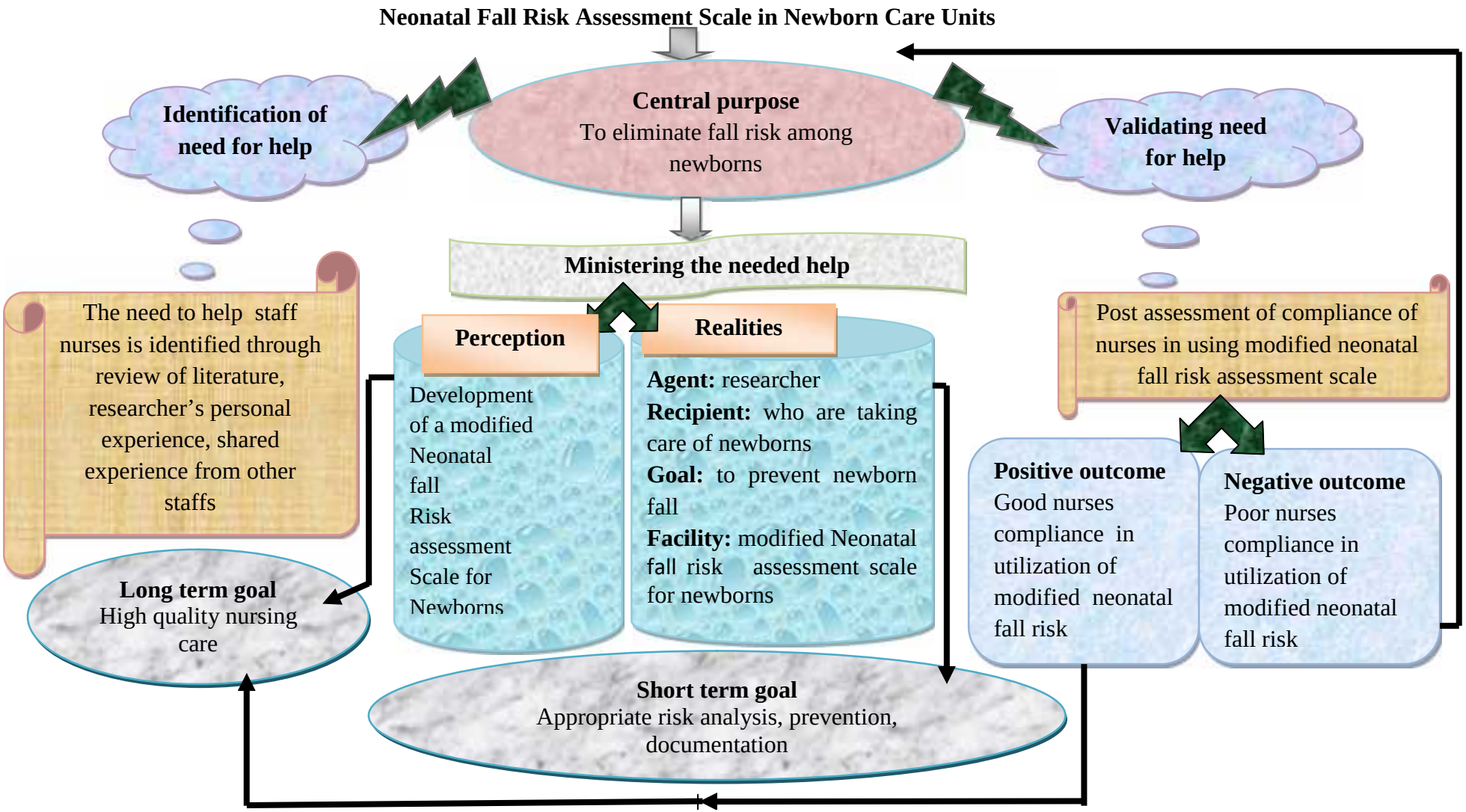


**Fig 1: Conceptual Framework based on Wiedenbach's Helping Art of Clinical Nursing Theory (1964)**

## Projected Outcome

This study will be useful in reducing the risk for falls in newborns as well as will help the staff nurses to document the assessment findings effectively.

## Summary

This chapter has dealt with the background, need for the study and statement of the problem, objectives, operational definitions, research hypothesis, assumptions, delimitations and conceptual framework.

## Organization of the Report

Further aspects of the study are presented in the following five chapters.

**In Chapter – II:** Review of literature

**In Chapter – III:** Research methodology includes research approach, research design, setting, population, sample and sampling techniques, tool description, content validity and reliability of tools, pilot study, data collection procedure and plan for data analysis.

**In Chapter – IV:** Analysis and interpretation of data

**In Chapter – V:** Discussion

**In Chapter – VI:** Summary, conclusion, implications and recommendations.

# CHAPTER II

# REVIEW OF LITERATURE

Literature review is an organized written presentation of what has been published on a topic by scholars (Burns & Groove, 2004).

The task of reviewing literature involves the identification, selection, critical analysis and reporting of information on the topic of interest. A review acquaints the researcher with what has been done in the field and minimizes possibilities of unintentional duplications. It justifies the need for replication, provides the basis of future investigations and helps to relate the findings of one study to another.

This chapter deals with a review of published and unpublished research studies and from related material for the present study. The review has helped the investigator to develop an insight into the problem area and in building the foundation for the study. The review is organized and presented under the following headings**.**

- ✓ Newborn Care
- ✓ Newborn Fall
- ✓ Statistics of Newborn Mortality
- ✓ Preventive Measures for Fall in Newborn

## Newborn Care

Community Newborn Care in West Bengal, India, has a partnered organization with government, UNICEF and National Neonatology forum and professionals (2004) did a complementary program which was supported by CARE, DFID, and GTZ strengthen essential newborn care. The strategies were to

create an enabling environment where the well-being and survival of neonates were stressed. Selection of the most backward districts and provision of four resource persons in each district had achieved operationalization of neonatal care. Newborn corners in the neonatal wards in the hospital facilities were established in 155 locations in the State. Medical doctors, nurses, supervisors and TBA (Traditional Birth Attendees) were trained. Simple and appropriate equipments and supplies at the community, health centers and hospitals were provided.

A descriptive study was conducted by Baqui (2007) to assess the knowledge of mothers regarding newborn care in rural Uttar Pradesh. The objective of the study was to describe selected new born care practices related to cord care, thermal care, and breast feeding. The survey included 13,167 women who had live birth. Logistic regression was used in this study. This study concluded that mothers had limited skill in newborn care and new born care practices, counseling and teaching strategy essential for mothers. In addition, nurses are a great resource to show the mothers how to hold, burp, change, and care for newborn.

Wallace (2015) in a review and analysis of article on Balancing Family Bonding with Newborn Safety, mentions that an accidental injury of a newborn in the care of family members soon after a hospital birth can cause emotional stress and a guilt feeling. The challenge for hospitals is to support bonding of newborns with their families by encouraging breastfeeding, cuddling, holding, and touching while ensuring newborn safety.

**Newborn Fall**

The Emergency Department Injury Surveillance System in Greece (2004) reveals that, about 4400 infant fall injuries occur annually in Greece, corresponding to an annual incidence rate of 44 injuries per 1000 infants. The incidence of falls increases with advancement in infant age. A high percentage of severe injuries was detected, most of them concussions (14.3%) and fractures (9.4%). Approximately 10% of infants with fall-related injuries required hospitalization. More than 36% of fall injuries involved nursery equipment. Infant walker use was associated with a higher incidence of falls (about 9 per 1000 infant-years), and these falls occasionally involved stairs and caused serious injuries. Infant bouncers, strollers, and changing tables were all associated with similar incidence of falls (about 4 per 1000 infant-years).

Anne Arundel medical center (AAMC) 2012, reported about six newborn falls in their hospital. As a result of this, they developed a Newborn Fall Prevention Task Force. The goal of the task force was to identify factors associated with newborn fall. In 2013 while attending the Association of Women's Health ,Obstetric And Neonatal Nurses (AWHONN) convention, the center developed a plan stating that nurses and patient care technicians should discuss fall prevention with parents at least once every 12 hour shift, should develop patient handouts related to safety, should create signage for patient rooms to remind parents not to fall asleep with newborns in their bed, should create signage in postpartum units indicating the number of days since the last newborn fall, should discuss newborn falls in staff meetings and quality council meetings.

Helsley (2010) mentions that the experience of a seven hospital system in Oregon offers a template for understanding how and why infant falls occur in hospitals and how to address the issue. The issue for a two-year period, a query of a live voluntary event database yielded 9 cases of newborn falls from 22,866 births for a rate of 3.94 falls per 10,000 births. Newborns experience in-hospital falls at a rate of approximately 1.6–4.14/10,000 live births, resulting in an estimated 600–1,600 falls per year in the United States. Additional reports of rates of newborn falls are urgently needed to determine the true prevalence of this underreported event. Standardized evaluation and management guidelines need to be developed to aid the clinician in the appropriate care of newborns experiencing this infrequent event.

In Pennsylvania, the rate of newborn falls by year shows that the average length of stay in days for women who have given birth in all United States hospitals is 2.7 days. Of the 272 falls, 85.3% occurred when the newborn was less than four days. Of these 232 newborn falls, 42.7% occurred on day one and 32.8% occurred on day two. Pennsylvania health care cost containment council suggested that improving the safety of patients should be recognized as a priority issue in healthcare. Although falls and other injuries are primary concerns for hospitalized adults, there is a lack of study of newborn in literature addressing newborn falls and other injuries that occur while the newborn is in the care of family (Wallace, 2015).

Hitchcock (2012) in his case study which was presented in AWHONN mentions that the facility delivered approximately 3200 babies/year, and the rate of newborn falls in a 13 month period was 11.53 /10,000 live births. The reasons

for this higher rate have not been clear. As per his case study 4 infant falls occurred during a 13 month period. Each happened in the Couplet Care unit at midnight. The patients involved were all recovering from cesarean sections following a prolonged labor. Of the infants that fell, three were in bed with their mothers, the fourth involved the father. In the three cases involving the mother, all were holding their newborn, fell asleep, and were awakened by their newborn crying on the floor. One mother was breastfeeding, two were holding their newborn. In the fourth case, the father placed the newborn on the couch to change her diaper, turned for supplies and when he turned back, his newborn daughter was on the floor. In all cases, a support person was present but asleep at the time of the fall.

In a preliminary search of California Hospital Patient Safety Organization (CHPSO) falls and perinatal events, approximately 35 in-hospital infant falls from 2014-2015 were due to the following, the mother fell asleep with the infant in her arms, the nurse fell asleep while caring for the infant, visitors dropped the infant because of improper handling, visitors or hospital staff tripped over monitor chords, laptop or phone charging chords, or a baby warmer, the mother experienced a spasm and the infant fell off the bed. While all in-hospital falls are a significant issue for hospitals, a newborn fall is not only a potential harm to the infant, but it may cause the caregiver to feel embarrassed and ashamed for dropping the infant.

The American Academy of Pediatrics (AAP) developed guidelines in 2011 for safe-sleep practices immediately after birth. Five recommendations to prevent in-hospital newborn falls include: supine sleep position, firm sleep surface, room-

sharing without bed-sharing, avoiding alcohol and illicit drug prenatally and postpartum, and using Sudden Infant Death Syndrome (SIDS) risk-reduction recommendations by all healthcare providers starting at birth, (Smolenski, 2015).

Torino (2016) reports information which obtained from records of notification sheets and medical records of newborns who suffered fall in rooming-in care in 2013. Records of four newborn unintentional falls were found, showing an incidence of 11.36 falls per 10,000 live births. Three cases occurred during the night. Consequences for neonates range from no harm to moderate injuries, such as edema, hyperemia in temples and knees, fracture of the parietal bone, and hematoma that evolved in good conditions. Findings on the circumstances leading to the falls might help understand these accidents and show the need for implementation of fall prevention strategies that provide multidisciplinary care in a safe environment and promote education of mothers, families, and professionals. The results of this study show that, in spite of the limited sample, risks of NB falls were present in different circumstances, since falls occurred in equal proportion regarding the type of childbirth - natural and caesarean section, as well as the NB gender. Similarly, the puerperal women's age varied from adolescence (15 years old) to young (23 to 28 years old) and old adulthood (43 years old).

Teuten (2015) says that In-hospital falls can occur throughout the period the neonate stays in the hospital, however, there are certain recognized situations where this risk is increased: During delivery – In fast vaginal deliveries (compounded by a large volume of blood and fluid) there is a risk that the baby may slip through the hands of the health professional assisting the delivery of the baby;  During transport, either in the arms of someone who may trip and fall

themselves; or during transport in an insecure cot or an unharnessed baby buggy on an unsteady surface (eg. entering a lift, on a ramp)The post-partum period – When exhausted mothers (especially from high risk groups) are at risk of falling asleep cradling their newborn. These events are however, preventive and it is therefore essential that they be avoided.

Attention is needed in preventing patient falls in newborns and in obstetric units of hospitals. Majority of prenatal, postpartum, and newborn falls are preventable. Little effort has been made to address fall risk during the prenatal period, during labor, and after delivery in the postpartum period for moms and babies. Risk factors for falls in these populations have been identified, and targeted risk assessments and fall prevention interventions have been developed to eliminate these falls. Evidence demonstrates success in reducing falls with a variety of low-cost but high-return initiatives, comprising prenatal education, patient and family engagement, implementation of unique fall risk assessment tools, postpartum mobility assessments, and changes in patient rounding frequency (Gaffey, 2015).

Staggs (2015) says that, in neonatal units, safety concerns are not falls during ambulation but events in which a baby rolls or slides off the edge of a bed or some other piece of furniture and events in which the baby is dropped while being carried, held, or transferred from person to person. They decided that rather than creating a separate indicator for these events, they get incorporated in the expanded falls indicator and they revised fall definition, any “sudden, unintentional descent,” and made it broad enough to encompass both falls from furniture and drops. And they mention that “we created a special category for baby/child drops, which we defined as follows: “A fall in which a

newborn, infant, or child being held or carried by a healthcare professional, patient, family member, or visitor falls or slips from that person's hands, arms, lap, etc." In defining baby/child drops, the revised guidelines explicitly exclude falls from furniture, noting that drops "always involve the child and the person who drops the child." Both falls from furniture and baby/child drops are counted in a unit's total falls count."

**Statistics of Newborn Mortality**

In an article published in The Journal of Pediatric Neuroscience. Sohini (2007) presented here a rare case of a newborn suffering from a fall from mother's lap causing epidural hematoma (EDH). The baby had an accidental fall from mother's lap in a postnatal ward. The baby was found to have a left parieto temporal hematoma and scalp swelling. They mention that traumatic head injuries lead to 2% of neonatal deaths. A retrospective study done by Leestma (2007) comprising 31 study subjects below 2 months of age revealed fall as the commonest etiology irritability or persistent crying was found to be the most common symptom whereas cephal hematoma was found to be the most common sign.

A descriptive study was conducted in a maternity of a public, teaching hospital in the city of São Paulo. The objective of the study was to describe occurrences of newborn falls in the hospital environment. Information was obtained from records of notification sheets and medical records of newborns who suffered falls in rooming-in care in 2013. Records showed four newborn unintentional falls, showing an incidence of 11.36 falls per 10,000 live births. Three cases occurred during the night. Consequences for neonates ranged from no harm to moderate injuries, such as edema, hyperemia in temples and knees,

fracture of the parietal bone, hematoma that evolved in good conditions. Findings on circumstances of falls might help to understand these accidents and show the need for implementation of fall prevention strategies that provide multidisciplinary care in a safe environment and promote education of mothers, families, and professionals.

**Preventive Measures for Fall in Newborns**

Abike (2010) have published a study on a new scale for evaluating the risks for in- hospital falls of newborn from admission till discharge. They prepared a scale on the basis of failure modes and effects analysis criteria. They confirmed that the scale increases the awareness and sensitivity to know the risks. They found that most risky situations for newborn fall was when the mother was holding the baby while getting epidural analgesia and also during transportation of the baby after delivery.

In Huntsville hospital for women and children evidence based quality improvement project was conducted regarding newborn falls; they found that there were seven newborn falls during a seven month time period in hospital postpartum unit. So they added a safety instruction sheet for parents at admission, new crib cards with information on falls prevention, room posters and mirror clings with fall information. Parents were educated on newborn falls during child birth classes. Staff education promotion activities were conducted through mandatory classes, e-mails, staff meetings, and introduced new fall risk assessment tool to charting system and a newborn post fall debriefing form was created for use after fall events. They audited the effectiveness of new strategies and found significant reduction in incidence of newborn fall (Anisworth, 2013).

Magri (2013) mentions the Implementation of a Newborn Safety Partnering Agreement for Parents on the mother–baby unit raises awareness to prevent infant falls and injury. According to Eileen (2011), a report generated in December 2011 from the online-incident reporting system indicated the occurrence of three infant falls (6.6 falls per 10,000 births) in 2011. Two infants falls (4.4 falls per 10,000 births) were reported in 2009 and no infant falls were reported in 2010. All incidents took place during the night shift and infant falls were due to the mother falling asleep. None of the newborns suffered any serious injury. The mother–baby unit had just completed a project to increase exclusive breastfeeding and more infants (>70%) were roomed-in with their mothers. There was a concern on the part of the staff that the new mother–baby care delivery model would be blamed for the increased rate in falls. Another reason could be because the hospital had purchased new beds in which the side rails were not as high when the head of the bed was elevated.

A paper published by Hodges (2013) on The Unthinkable: Using Risk Resilience to Eliminate Newborn Falls mentions the preventive measures taken to prevent newborn fall in hospitals such as an improvement plan to include safety huddles for mothers who were morbidly obese to plan frequent monitoring and students and nurses were taught how to recognize signs of fatigue and partner with the mother to safely place the baby in the crib.

Education materials to engage, around second night syndrome and prevention strategies was given. A mother's nap time was initiated to promote proper rest. Stories were shared at the shared governance councils to highlight hidden assumptions and strategies to prevent further events. Nurses designed a

safety programs resulting in no harm for vulnerable newborns. Providing nurses with the right resources, while taking immediate action, drives to zero quality failures for all populations.

A recent study in the maternity wards at Nottingham University Hospitals Trust by Janiszewski (2015) reports that in a 12 month period there were 17 baby falls; two of the babies who had fallen were injured. She then audited the incidence retrospectively using nurse's notes and found that most of the incidents were due to mothers' restricted mobility, having had a caesarean section, fallen asleep with the baby in her arms, fallen from her arms onto the floor .She prepared a curtains risk assessment tool and provided appropriate cots with drop down side. This reduced the incidence of newborn falls.

Gaffey 2015 mentions the usage of a variety of low-cost but high-return initiatives, comprising prenatal education, patient and family engagement, implementation of unique fall risk assessment tools, postpartum mobility assessments, and changes in patient rounding frequency.

In an article on innovative programs published by Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN) Convention by Allen (2017) mentions safety checks performed every 30 minutes by the staff, and a signed parent acknowledgement of risks of sleeping with infant and ways to prevent infant falls. There were eight infant falls 5 years before the implementation of the program. Since the implementation, there was no infant falls. Anecdotal reports identified several near-miss events, with nurses waking the mothers and placing infants in bassinets. Through the teach-back technique, patients have demonstrated an understanding of

the importance of infant fall prevention and the risks of co-bedding or placing an infant in an adult bed or couch to sleep.

## Summary

This chapter has dealt with a review of literature related to the problem stated. It has helped the researcher to understand the impact of the problem under study. It has also enabled the researcher to design the study, develop the tool, and plan the data collection procedure and to analyze the data. In this study researcher used 20 primary sources and 4 secondary sources for reference.

# CHAPTER III

# RESEARCH METHODOLOGY

Methodology of the research study is defined as the way, the data is gathered and analyzed in order to answer the research questions or analyze the research problem. The research methodology involves a systematic procedure by which the researcher starts from an initial identification of the problem and finds its conclusion (Polit & Beck, 2012).

This chapter deals with a brief description of the different steps undertaken by the investigator for the study. It includes research approach, research design, setting, population, the sample and sampling technique, development and description of tool, content validity, reliability, pilot study, protection of human rights and procedure for data collection and plan for data analysis. The present study was conducted to assess the compliance of the nurses with Modified Neonatal Fall Risk Assessment Scale for Newborns.

## Research Approach

Research approach is the most significant part of any research. The appropriate choice of the research approach depends on the purpose of the research study which is undertaken (Polit & Beck, 2012).For this study survey approach was used.

## Research Design

A research design incorporates the most important methodological design that the researcher work in conducting in a research study (Polit & Beck, 2012). The research design used in this study was Descriptive Correlational research design.

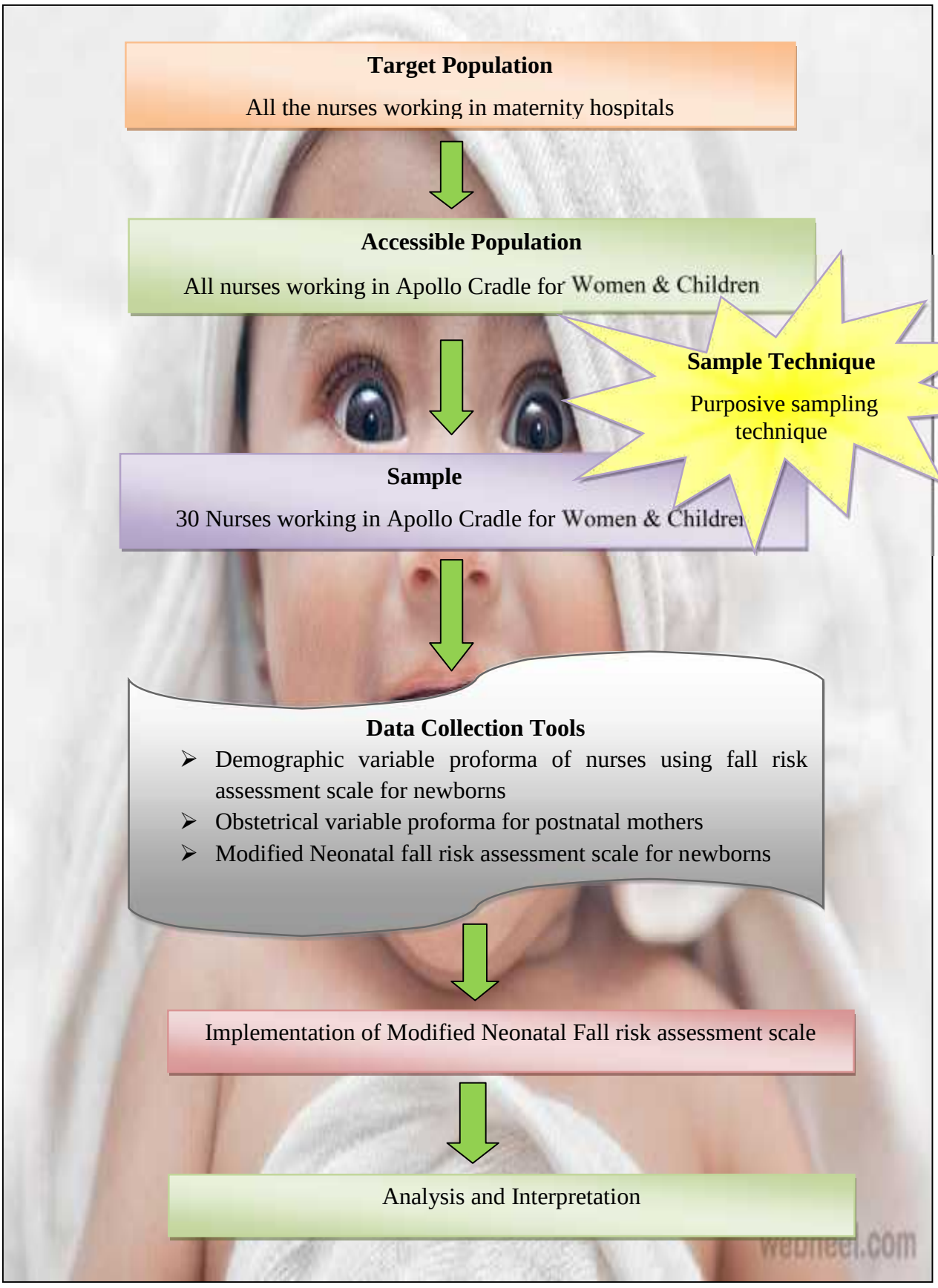


**Fig.2 Schematic Representation of Research Design**

## Variables

Variables are attributes that vary taking on different values (Polit & Beck, 2012).

### Dependent Variable

The variable hypothesized depends on or caused by another variable is the dependent variable (Polit and Beck, 2012).

In this study, Nurses' compliance in using Modified Neonatal Fall Risk Assessment Scale for newborn was considered as the dependent variable.

### Independent Variable

The variable that is believed to cause or influence the dependent variable is the independent variable (Polit & Beck, 2012). In this study Modified Neonatal Fall Risk Assessment Scale for newborn was considered as the independent variable.

### Attribute Variable

Variables that describe the study sample characteristics are termed as attribute variables (Polit and Beck, 2012).

In this study, the attribute variables were demographic variable such as age, professional qualification, institution trained, years of experience as a qualified nurse and experience in neonatal unit, in service education on neonatal fall, training in certified specialty courses.

## Research Setting

Research setting is the location and the conditions in which data collection in the study is made (Polit &Beck, 2012). The present study was conducted at Apollo Cradle for women & children. It is situated in Shafi Mohammed road, Chennai .It is a premier institute for boutique birthing, fertility clinic, advanced gynecological and obstetrics, pediatrics and neonatology. It is a 50 bedded hospital pioneering concept in childbirth and maternity care in India. Apollo Cradle was conceived to satisfy the service and quality needs of a younger generation of Indians. Apollo cradle is a healthcare facility of international standards. They strive to deliver clinical excellence, personalized care and utmost comfort to the mother, the baby and the family.

The average bed occupancy per month is 30 -40. They have a well equipped NICU with level I, II, III here 1:1 nurse patient ratio is followed. Level I has 3 beds for ventilator assisted cases, newborns weighing less than 750 gm, less than 30 weeks old, newborns who require CPAP for more than 48 hours and newborns who require other intensive care treatments are admitted. In level II it has 5 beds, newborn weighing 750gm to 1500gm are admitted there CPAP facilities are available it is a transitional level to normalcy. In level III, which has bed strength of 4 provides supportive care. They have an isolation room with one bed for infectious cases. Other than this they have a nursery with 2 beds here normal newborns that require timely management is taken cared.

## Population

### Target Population

It is the aggregate of cases in which a researcher is interested and would like to generalize the study results (Polit & Beck, 2012). In this study, the target population comprises all nurses working in maternity hospitals.

### Accessible Population

It is the aggregate of cases that conforms to designated criteria and are accessible as subjects for a study (Polit & Beck, 2012). In this study, the accessible population comprises of all nurses working in Apollo Cradle for women & children.

## Sample

A sample is a subset of a population selected to participate in a study. The sample size for the present study was 30 nurses working in Apollo Cradle Hospital.

## Sampling Technique

Sampling is the process of selecting a portion of the population to represent the entire population, purposive sampling is also known as judgmental sampling in which the researcher chooses the sample based on who they think would be appropriate for the study. (Polit & Beck, 2012).The samples were selected by purposive sampling technique, as there were limited numbers of nurses. In this study the researcher selected all the nurses working in Apollo Cradle Hospital.

## Sampling Criteria

### Inclusion Criteria

- All nurses working in NICU of Apollo Cradle Hospital.
- All nurses working in postnatal ward of Apollo Cradle Hospital.
- All nurses working in the nursery of Apollo Cradle Hospital.
- All nurses working in the labor ward of Apollo Cradle Hospital.

### Exclusion Criteria

- Nurses working in the Out Patient Department

## Selection and Development of Tools

Tools were developed / selected by the investigator based on a review of literature and opinion from experts. The instruments used were;

- Demographic Variable Proforma of Nurses Using Modified Neonatal Fall Risk Assessment Scale for Newborns
- Obstetrical Variable Proforma for Postnatal Mothers
- Modified Neonatal Fall Risk Assessment Scale for Newborns
- Practice Checklist for Nurses Using the Modified Neonatal Fall Risk Assessment Scale
- Scale to assess the nurses attitude towards Modified Neonatal Fall Risk Assessment Scale.

### Demographic Variable Proforma for Nurses Using Neonatal Fall Risk Assessment Scale for Newborns

Proforma to assess the background characteristics of nurses taking care of newborns in Apollo Cradle Hospital consisted of age, education, institution

trained, experience and specialty training of nurses, in service education on fall risk assessment scale.

**Obstetrical Variable Proforma for Postnatal Mothers**

Proforma to assess variables such as age, ordinal position of the child's birth, mode of delivery, pain score day 1, 2 & 3, type of analgesics used by mother, history of co morbidity.

**Modified Neonatal Fall Risk Assessment Scale for Newborns**

Modified Neonatal Fall Risk Assessment Scale for Newborns was a scale developed by the Bayindir Hospital which was then modified by the investigator for use in Apollo Cradle Hospital. It is a checklist with 17 items explaining the various fall risk factors in newborns who are admitted in hospital. It has two options yes/no. Each yes response was given score 1 and a wrong response 0. However, item no 8 was given a score of 3 for yes response and item no 17 was given 4 for yes responses, as these items measured high risk factors. Hence the obtainable score was 0 – 22.

**Score interpretation**

| **Risk** | **Score** |
|---|---|
| High risk | ≥4 |
| Low risk | 1 - 3 |

**Practice Checklist for Nurses using the Modified Neonatal Fall Risk Assessment Scale**

Practice checklist was prepared by the investigator for assessing compliance of nurses using the Modified Neonatal Fall Risk Assessment Scale,

this consisted of 38 items. It included newborn and mothers risk factors and preventive measures. Item no 7, 9, 10 was not applicable to nurses in labor ward, OT and postnatal wards so their maximum score was 66 and item no 5, 6, 11, 12, 13, 14, 15, 16, 17 was not applicable for nurses working in NICU and nursery so their maximum attainable score was 32. If nurses are compliant for a particular item means they were scored 2, if they are partially compliant they were scored 1 and for non complaint nurses they were scored 0

**Score Interpretation**

| **Score** | | | |
|---|---|---|---|
| **Labor ward, OT & Postnatal Ward** | **NICU & Nursery** | **Percentage** | **Level** |
| 0 - 33 | 0 – 16 | ≤50 % | Non compliant |
| 34 – 50 | 17 - 24 | 51 – 75 % | Partially compliant |
| 51 - 66 | 25 - 32 | 76 – 100% | Compliant |

**Attitude Scale to Assess the Nurses Attitude towards the Modified Neonatal Fall Risk Assessment Scale.**

A scale to assess the attitude of nurses towards the Modified Neonatal Fall Risk Assessment Scale was developed by the researcher. This Likert scale consisted of 10 items out of which 5 were negative statements and 5 positive statements. Each statement had separate columns with responses such as strongly agree, agree, uncertain, disagree, strongly disagree. Nurses were asked to express their responses to the statements in the respective columns. Negative statements were scored using reverse scoring (item no: 2, 4, 6, 8, 9).

**Score Interpretation**

| Score | Percentage | Interpretation |
|---|---|---|
| ≤25 | ≤50% | unfavorable attitude |
| 26 -37 | 51 – 75% | partially favorable attitude |
| 38 -50 | 76 – 100 | favorable attitude |

## Psychometric Properties of the Instrument

### Validity

Content validity is the degree to which an instrument measures what it is supposed to measure. Content validity is the sampling adequacy of the content being measured. (Polit & Beck, 2012).

The content validity of the tool was obtained by getting opinion from 10 experts in the field of Medicine and Nursing. They had suggested some specific modifications in the demographic variable, Modified Neonatal Fall Risk Assessment Scale and rating scale. The modifications and suggestions of experts were incorporated in the final list prepared of the tool.

### Reliability

Reliability is the degree of consistency with which an instrument measures the attribute it intended to measure (Polit & Beck, 2012). The reliability of the tools was determined by using the split half method and inter rater technique. Karl Pearson's 'r' was computed for finding out the reliability.

Practice observational check list for nurses' – Inter rater technique (r = 0.76)

Rating scale for nurses' satisfaction – Split half method (r = 0.86)

## Pilot Study

According to Polit and Beck (2012), a pilot study is a miniature or part of the actual study, in which the instruments are administered to the subjects drawn from the population. It is a small scale version or trial run, done in preparation for the major study. The purpose is to find out the feasibility and practicability of the study design.

The pilot study was conducted in Apollo Cradle Hospital at Chennai from 1.11.16 to 5.11.16. Six nurses' were selected as study participants. Demographic data was collected from them after obtaining verbal consent from them. Modified Neonatal Fall Risk Assessment Scale for newborn was introduced to them and usage and practice and compliance of nurses were assessed using observation check list. Consecutively three observations were done. The observation was done for three days for each nurse. The pilot study, indicated the feasibility and effectiveness of the study and the study instruments were found to be appropriate.

## Protection of Human Rights

- ✓ The study was conducted after obtaining clearance from the Ethics committee, Apollo Hospitals, Chennai.
- ✓ Formal permission was obtained from principal of Apollo College of Nursing, head of pediatric department and head of Apollo Cradle Hospital.
- ✓ Consent was obtained from all the participants before the data collection. Confidentiality was maintained throughout the study.

## Data collection procedure

Data collection is the precise, systematic gathering of information needed to address a research problem (Polit and Beck, 2012). Formal permission was obtained from the Ethics Committee, Principal of Apollo College of Nursing, Head of pediatric department and head of Apollo Cradle Hospital. A group of 30 nurses who were taking care of neonates were selected using the purposive sampling method and consent was obtained from them. The baseline data was collected using demographic variable proforma for nurses and obstetrical proforma for postnatal mothers.

Explanation and instruction were provided to nurses in the use of Modified Neonatal Fall Risk Assessment Scale for Newborns for the assessment of fall risk in newborns and to document the score and preventive measures to be taken for that particular baby. The observation schedule was from 7a.m-7p.m and the data collection period was from 02.11.16' to 10.12.16'. Three consecutive observations were done for three days with the data collection tool. The compliance of nurses with the use of the Modified Neonatal Fall Risk Assessment Scale for newborn was assessed using the observational check list. The observation was done for 3 consecutive days for each nurse's.

Practice checklist for assessing compliance of nurses who were using the Modified Neonatal Fall Risk Assessment Scale, the scale consisted of 38 items which included newborn and mothers risk factors and preventive measures. Observation was done by the researcher during the assessment by nurses.

Then the attitude of nurses towards fall risk assessment scale was assessed after three days using likert scale. Nurses were asked to express their responses to the statements in the respective columns.

## Problems Faced During Data Collection

The problems faced during the process of study were

- Lack of time for nurses to participate in the study
- A few nurses were not interested in providing information

## Plan for data analysis

Data analysis is the systematic organization and synthesis of research data and testing of research data and testing of research hypothesis by using the obtained data (Polit and Beck, 2012). Analysis and interpretation of the data was carried out using descriptive and inferential statistics. Descriptive statistics like frequency, percentage, mean, standard deviation and inferential statistics like chi square test were used for data analysis.

## Summary

This chapter has dealt with the selection of research approach, research design, setting, population, sample, sampling technique, sampling criteria, selection and development of study instruments, validity, reliability of the study, pilot study, data collection procedure, problems faced during data collection and plan for data analysis.

# CHAPTER IV

# ANALYSIS AND INTERPRETATION

This chapter deals with analysis and interpretation of data collected on a number of issues from various sources. Statistics is a field of study concerned with techniques or methods of data collection, classification, summarizing, interpretation, drawing inferences, testing of hypothesis, making recommendations etc. (Mahajan, 2004) Data was collected from 30 nurses at Apollo Cradle Hospital to assess the compliance of nurses with the use of Modified Neonatal Fall Risk Assessment Scale for Newborns in Apollo Cradle Hospital. The data was analyzed according to the objectives of the study, tabulated and interpreted using descriptive and inferential statistics.

## Organization of the Findings

The findings of the study have been organized and presented under the following headings:

- ✓ Frequency and Percentage Distribution of Demographic Variables of Nurses using Modified Neonatal Fall Risk Assessment Scale for Newborns.
- ✓ Frequency and Percentage Distribution of Obstetrical Variable of Postnatal Mothers
- ✓ Frequency and Percentage Distribution of Compliance of Nurses Using Modified Neonatal Fall Risk Assessment Scale for Newborns on Day1, 2 and 3

- ✓ Mean and Standard Deviation of the Compliance of Nurses Who are Using Modified Neonatal Fall Risk Assessment Scale for Newborns on Day1, 2 and 3
- ✓ Incidence of Newborn Falls After Implementing Modified Neonatal Fall Risk Assessment Scale for Newborns
- ✓ Association between the Selected Demographic Variables and Compliance of Nurses Using Modified Neonatal Fall Risk Assessment Scale on Day 1
- ✓ Association between the Selected Demographic Variables and Compliance of Nurses Using Modified Neonatal Fall Risk Assessment Scale on Day 2
- ✓ Association between the Selected Demographic Variables and Compliance of Nurses Using Modified Neonatal Fall Risk Assessment Scale on Day 3
- ✓ Percentage Distribution of the Nurses based on their Attitude on Modified Neonatal Fall Risk Assessment Scale for Newborns

**Table 1**: **Frequency and Percentage Distribution of Demographic Variables of Nurses Using Modified Neonatal Fall Risk Assessment Scale for Newborns**

**(N=30)**

| S. No. | Variables | f | % |
|---|---|---|---|
| 1. | **Age** | | |
| | ≤ 22 years | 14 | 46.6 |
| | 23 - 25 years | 16 | 53.3 |
| | 26 – 28 years | – | – |
| | ≥29 years | – | – |
| 2. | **Professional Qualification** | | |
| | ANM | – | – |
| | Diploma in nursing | 2 | 6.6 |
| | B. Sc (N) | 28 | 93.3 |
| 3. | **Attended In Service Education Regarding Neonatal Fall Prevention** | | |
| | Yes | 4 | 13.3 |
| | No | 26 | 86.6 |
| 4. | **Undergone any Newborn related Certified Specialty Training** | | |
| | Yes | 4 | 13.3 |
| | No | 26 | 86.6 |

We can infer from the above table that more than half of the nurses were aged 23 – 25 years, (53.3%), qualified with B.Sc (N) (98.3%), majority of them had not attended any in-service education on fall risk prevention or had undergone newborn related certified specialty training (86.6%).

Fig 3 shows that most of the nurses had graduated from private institutions (70%). Fig.4 depicts that majority of the nurses had ≤ 1 year (66.6%) experience.


**Fig. 3 Percentage Distribution of Nurses Based on Type of Institution Trained**


**Fig. 4 Percentage Distribution of Years of Experience of Nurses**

**Table 2: Frequency and Percentage Distribution of Obstetrical Variables of Postnatal Mothers**

**(N=10)**

| S. No | Obstetrical Variables | f | % |
|---|---|---|---|
| **1.** | **Age** | | |
| | ≤ 20 years | - | - |
| | 21 - 30 years | 6 | 60 |
| | 31 – 40 years | 5 | 50 |
| | >40 years | - | - |
| **2.** | **Ordinal position of the child's birth** | | |
| | One | 7 | 70 |
| | Two | 3 | 30 |
| | Three | - | - |
| | Four | | |
| **3.** | **Type of analgesics used by mother** | | |
| | Oral pills | - | - |
| | IV injections | 9 | 90 |
| | Patient controlled analgesia | - | - |
| | Epidural analgesia | 1 | 10 |

The data from table 2 reveals that more than half of the mothers were aged 21 - 30 years (60%), Primipara (70%). Majority of mothers had a pain score of 4 – 7 on day 1, day 2 and day 3 (80%, 70%, 50 %). Majority of mothers (90%) got analgesics through intravenous route.

Fig 5 Percentage Distribution of Pain Score on Day 1, Day 2 and Day 3.

Fig 6 shows that more than fifty percent newborns were delivered by cesarean section.

Fig 7 reveals that more than half of the mothers (60%) had no co-morbid illness.

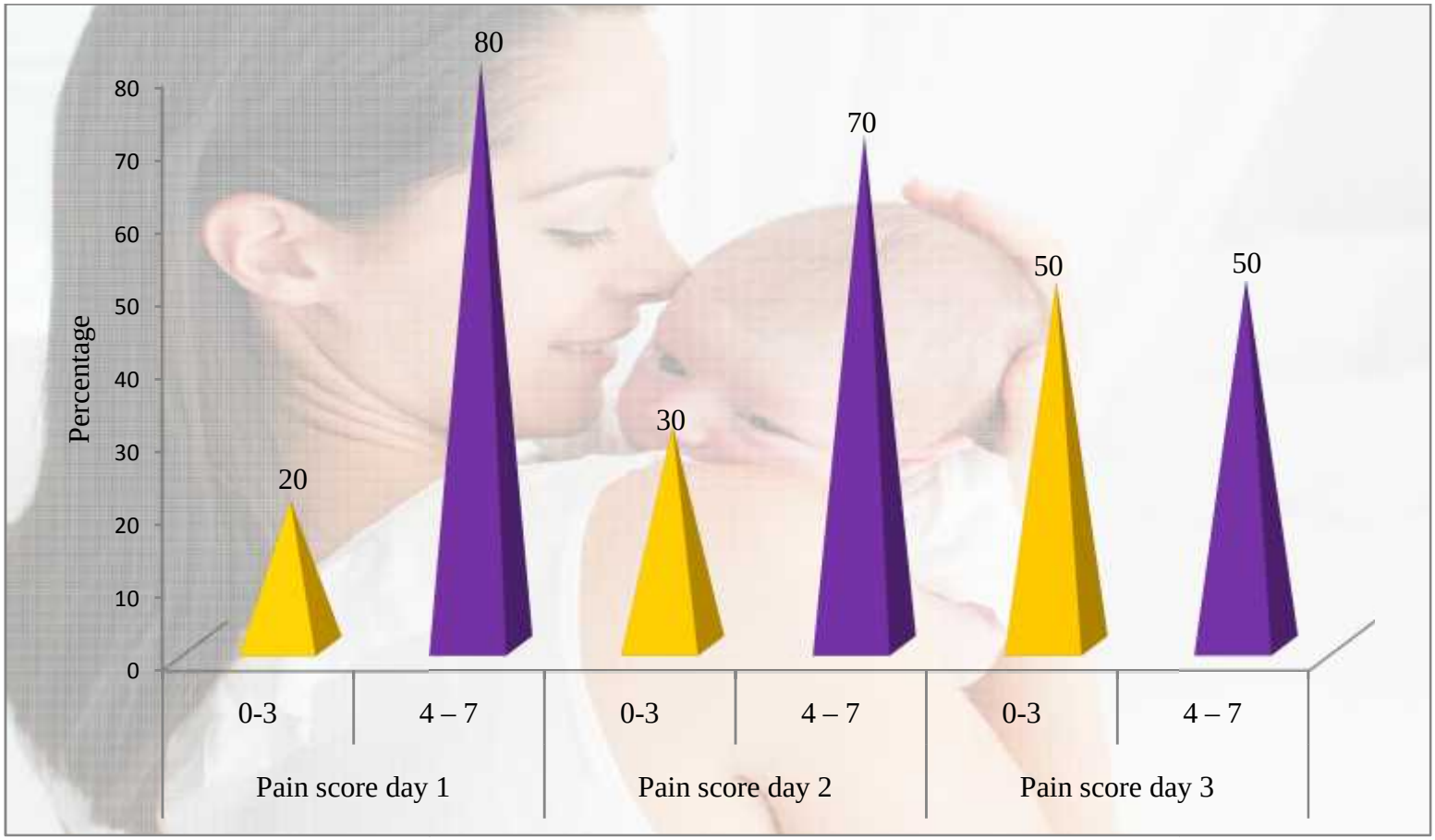


**Fig.5: Percentage Distribution of Pain Score on Day 1, Day 2 and Day 3**

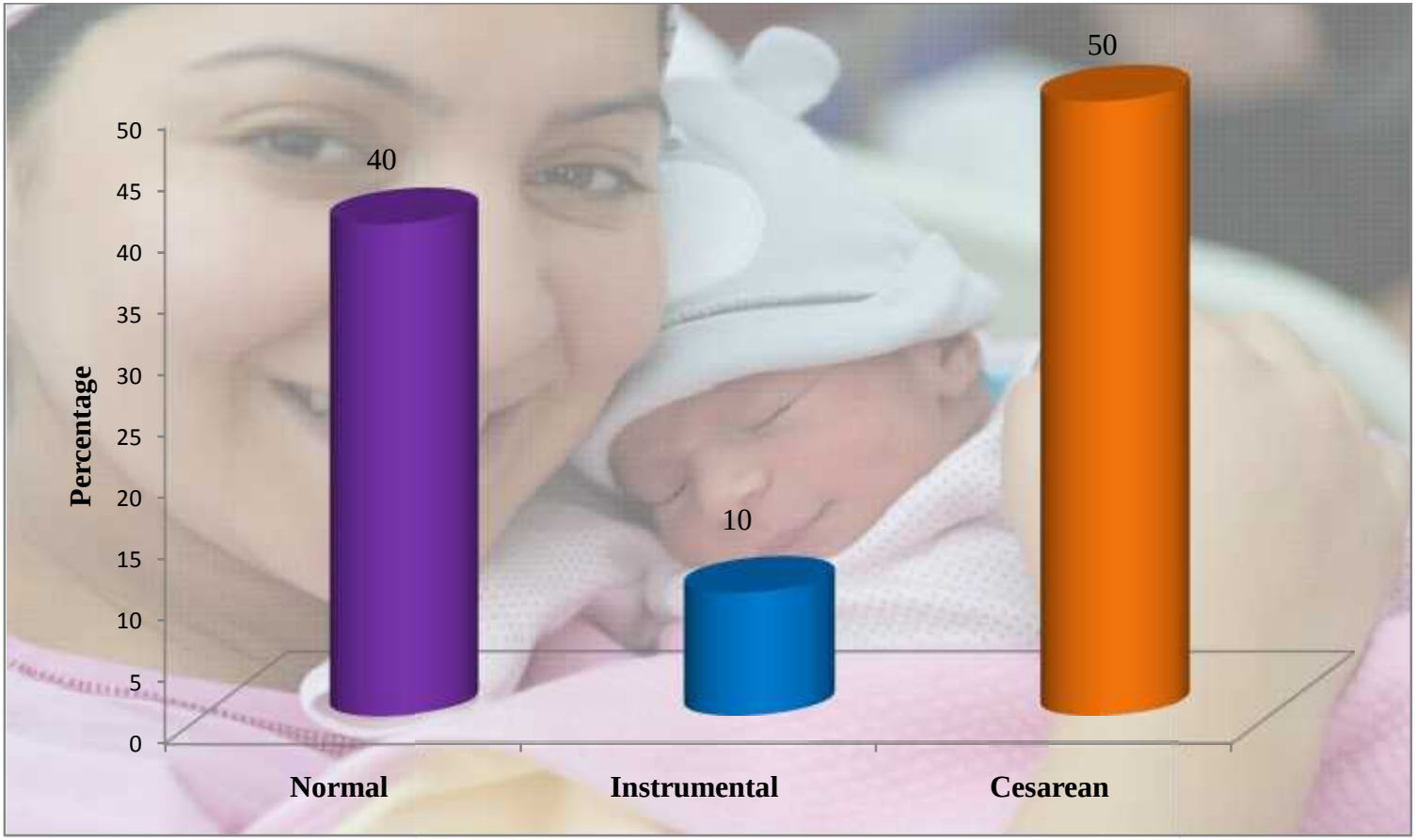


**Fig.6: Percentage Distribution of Mode of Delivery**

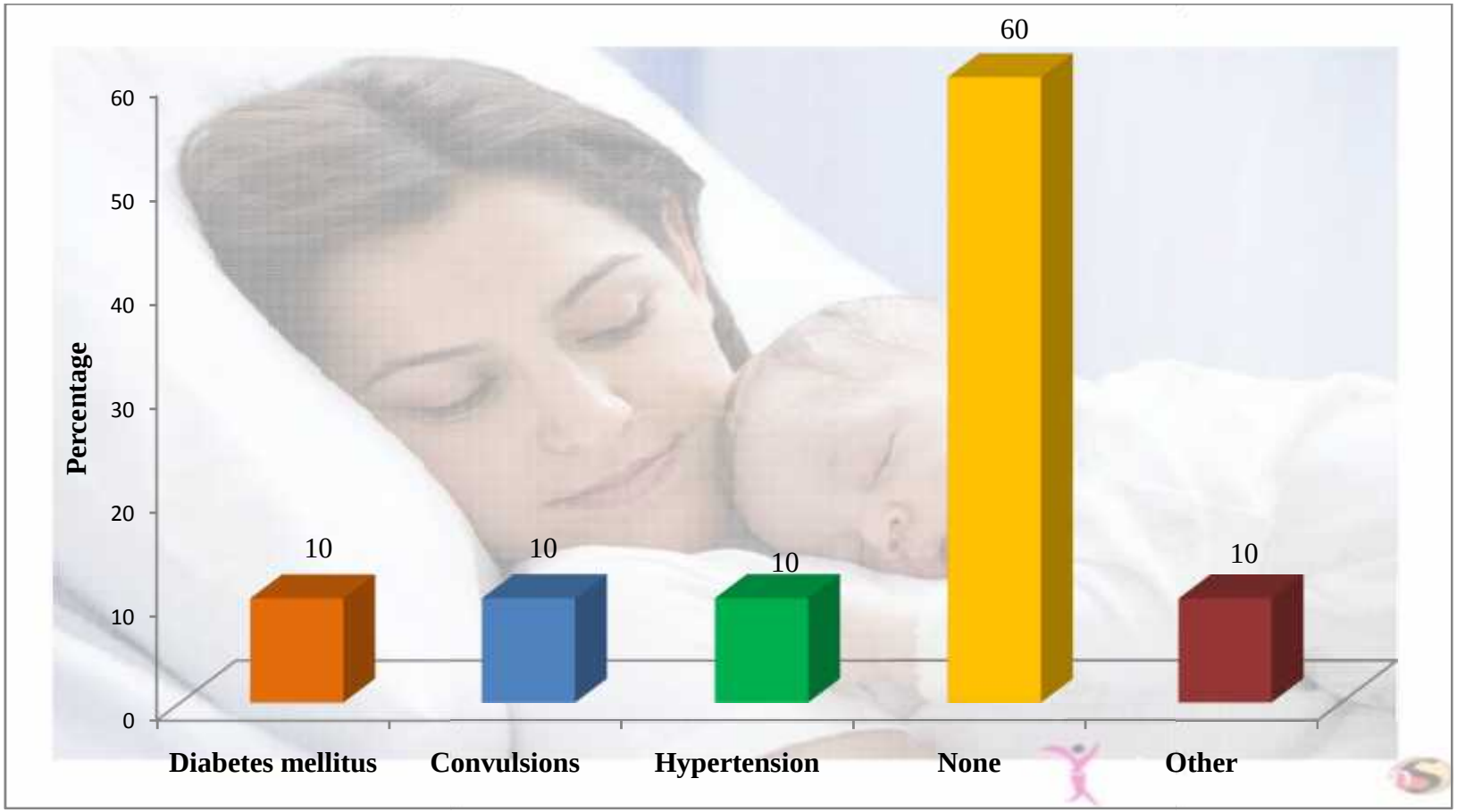


**Fig.7: Percentage Distribution of History of Co-morbidity**

**Table 3: Frequency and Percentage Distribution of Compliance of Nurses Using Modified Neonatal Fall Risk Assessment Scale for Newborns on Day 1, 2 and 3**

**(N=30)**

| Days | Labor Room, OT and Postnatal Wards (n=15) | | | NICU and Nursery (n=15) | | |
|---|---|---|---|---|---|---|
| | Compliant | Partially Compliant | Non Compliant | Compliant | Partially Compliant | Non Compliant |
| | f (%) | f (%) | f (%) | f (%) | f (%) | f (%) |
| Day1 | _ | 9 (60) | 6 (40) | 9 (60) | 6 (40) | _ |
| Day2 | 3 (20) | 9 (60) | 3 (20) | 15 (100) | _ | _ |
| Day3 | 12 (80) | 3 (20) | _ | 15 (100) | _ | _ |

The above table reveals that the compliance of nurses who used modified neonatal fall risk assessment scale for newborns was found to higher on day 3 (80%) among the nurses working in labor ward, OT and postnatal ward and in NICU and nursery all the nurses (100%) were compliant on day 2 and 3.

**Table 4: Mean and Standard Deviation of Compliance of Nurses Using Modified Neonatal Fall Risk Assessment Scale for Newborns on Day 1, 2 and 3 (N=30)**

| Levels | Maximum Score | Day1 | | Day2 | | Day3 | |
|---|---|---|---|---|---|---|---|
| | | M | SD | M | SD | M | SD |
| **Labor Room, OT & Postnatal Wards (n = 15)** | 66 | 34.2 | 9 | 40 | 7.53 | 50.1 | 7.68 |
| **NICU & Nursery (n = 15)** | 32 | 23.3 | 3.7 | 28.2 | 2.8 | 29.1 | 1.95 |

We can infer from the above table that the mean and standard deviation on the compliance of nurses taking care of the newborn was found to be higher on the third day of implementation of modified neonatal fall risk assessment scale for newborns (M =50.1 & SD = 7.68) in comparison with day 1 (M = 34.2 & SD = 9) and day 2 (M = 40 & SD = 7.53) for nurses in labor ward, OT and postnatal ward and it also depicts that for nurses working in NICU and nursery it was higher on day 3 (M = 29.1 & SD = 1.95 ) in comparison with day 1 (M = 23.3 & SD = 3.7) and day 2 (M = 28.2 & SD = 2.8).

**Table 5: Incidence of Newborn Falls after Implementing Modified Neonatal Fall Risk Assessment Scale for Newborns**

**(N= 10)**

| **Incidence** | **f** | **%** |
|---|---|---|
| Incidence of falls | 0 | 0 |

Table 5 depicts that there is no incidence of falls after implementation of Modified Fall Risk Assessment Scale for Newborns.

**Table 6: Association between Selected Demographic Variables and Compliance of Nurses Using Modified Neonatal Fall Risk Assessment Scale on day1 ( N =30)**

| Variables | Postnatal Ward, Labor Ward, OT | | | NICU And Nursery | | |
|---|---|---|---|---|---|---|
| | Non Compliant | Partially Compliant and Compliant | $\chi^2$ df =1 | Partially Compliant and Non Compliant | Compliant | $\chi^2$ df =1 |
| **Age** | | | | | | |
| ≤ 22 years | 5 | 5 | 1.64 | 3 | 2 | 0.31 |
| 23 - 25 years | 1 | 4 | NS # | 6 | 4 | NS # |
| **Professional Qualification** | | | | | | |
| Diploma in nursing | 0 | 1 | – | 1 | 0 | – |
| B. Sc (N) | 6 | 8 | | 9 | 5 | |
| **Institution Trained** | | | | | | |
| Private | 2 | 7 | 3.16 | 7 | 4 | 0.62 |
| Mission | 4 | 2 | NS # | 3 | 1 | NS # |
| **Years of Experience as a Qualified Nurse** | | | | | | |
| ≤ 1 | 4 | 7 | 0.52 | 5 | 4 | 1.64 |
| 2 – 3 | 2 | 2 | NS # | 5 | 1 | NS # |

Note: # Yates Correction Value

Note: Since the sample size, cell and observed values were small for chi square analysis, for nurses working in postnatal ward, labor ward and OT, categories such as partially compliant and compliant was clubbed. For nurses working in NICU and Nursery, categories such as partially compliant and non compliant are clubbed based on the distribution of data.

Table 6 infers that there is no association between selected demographic variable and compliance of nurses in the first day. Hence the null hypothesis $H_0$1; There will be no significant association between compliance of nurses using Modified Neonatal Fall Risk Assessment Scale and selected demographic variables of nurses is retained.

**Table 7: Association between Selected Demographic Variables and Compliance of Nurses using Modified Neonatal Fall Risk Assessment Scale on day 2 (N =30)**

| Variables | Postnatal Ward, Labor Ward, OT | | | NICU And Nursery | | |
|---|---|---|---|---|---|---|
| | **Partially Compliant and Non Compliant** | **Compliant** | **$\chi^2$ df =1** | **Partially Compliant and Non Compliant** | **Compliant** | **$\chi^2$ df =1** |
| **Age** | | | | | | |
| ≤ 22 years | 7 | 3 | 2.71 | 0 | 10 | |
| 23 - 25 years | 5 | 0 | NS # | 0 | 5 | _ |
| **Professional Qualification** | | | | | | |
| Diploma in nursing | 1 | 0 | _ | 0 | 1 | _ |
| B. Sc (N) | 11 | 3 | | 0 | 14 | |
| **Institution Trained** | | | | | | |
| Private | 6 | 3 | 3.18 | 0 | 11 | _ |
| Mission | 6 | 0 | NS # | 0 | 4 | |
| **Years of Experience as a Qualified Nurse** | | | | | | |
| ≤ 1 | 7 | 3 | 2.17 | 0 | 9 | |
| 2 – 3 | 5 | 0 | NS # | 0 | 6 | _ |

Table 7 reveals that there is no association between selected demographic variable and compliance of nurses on the second day. Hence the null hypothesis $H_0$1; There will be no significant association between compliance of nurses using Modified Neonatal Fall Risk Assessment Scale and selected demographic variables of nurses is retained.

**Table 8: Association between Selected Demographic Variables and Compliance of Nurses in using Modified Neonatal Fall Risk Assessment Scale on Day 3**

**(N=30)**

| Variables | Postnatal Ward, Labor Ward, OT | | | NICU And Nursery | | |
|---|---|---|---|---|---|---|
| | **Non Compliant** | **Partially Compliant and Compliant** | **$\chi^2$ df =1** | **Partially Compliant and Non Compliant** | **Compliant** | **$\chi^2$ df =1** |
| **Age** | | | | | | |
| ≤ 22 years | 0 | 10 | | 0 | 10 | |
| 23 - 25 years | 0 | 5 | _ | 0 | 5 | _ |
| **Professional Qualification** | | | | | | |
| Diploma in nursing | 0 | 1 | _ | 0 | 1 | _ |
| B. Sc (N) | 0 | 14 | | 0 | 14 | |
| **Institution Trained** | | | | | | |
| Private | 0 | 9 | | 0 | 11 | |
| Mission | 0 | 6 | _ | 0 | 4 | _ |
| **Years of Experience as a Qualified Nurse** | | | | | | |
| ≤ 1 | 0 | 11 | | 0 | 9 | |
| 2 – 3 | 0 | 4 | _ | 0 | 6 | _ |

Note: Since the sample size, cell and observed values are small for chi square analysis, for nurses working in postnatal ward, labor ward and OT, categories such as partially compliant and compliant are clubbed. For nurses working in NICU and Nursery, categories such as partially compliant and non compliant are clubbed based on the distribution of data.

Table 8 reveals that all the nurses are complaint on day 3, so chi square is not applicable to this table.

Fig7: Percentage Distribution of Nurses Based on Their Attitude on Modified Neonatal Fall Risk Assessment Scale for Newborns

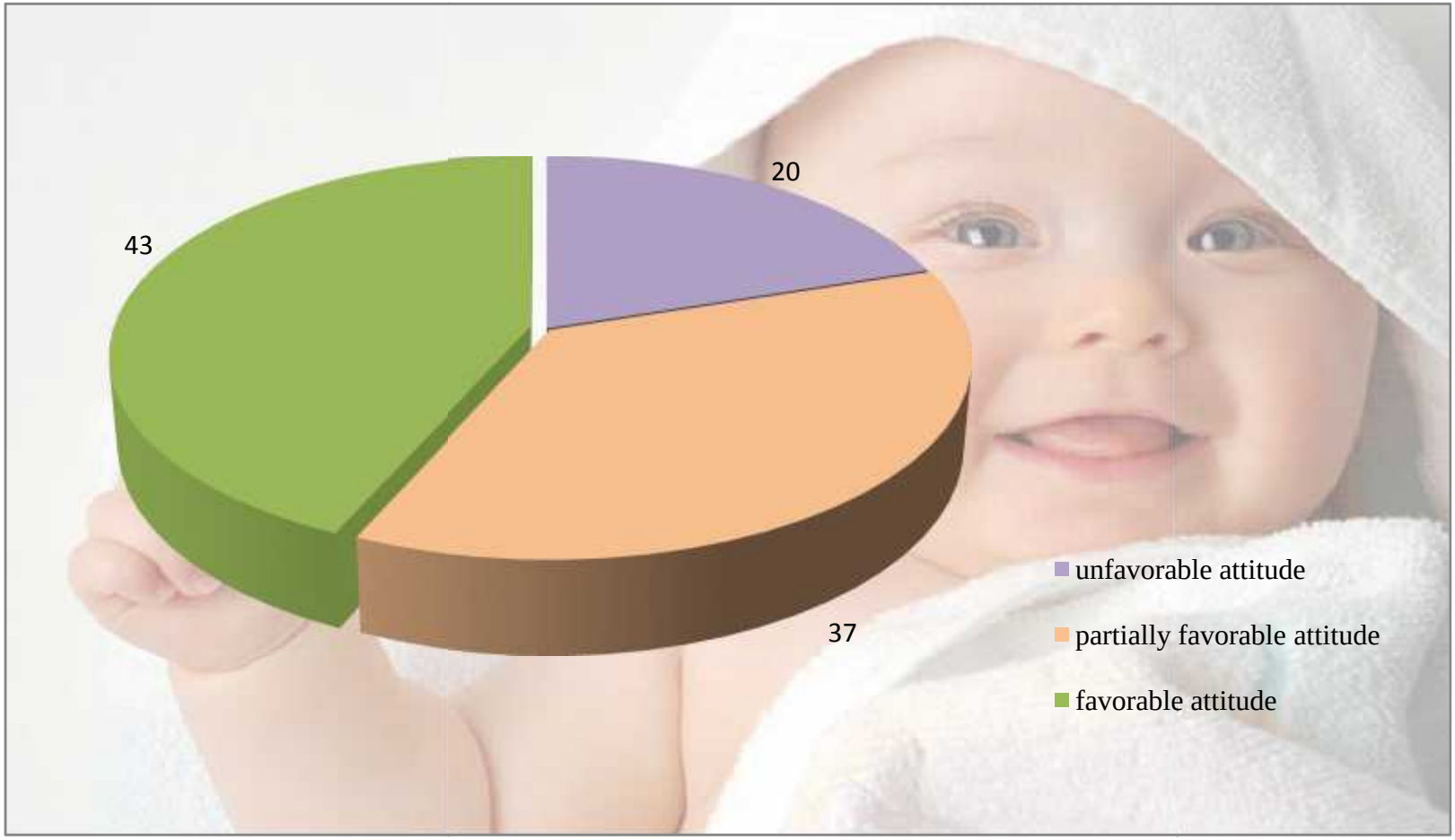


**Fig7: Percentage Distribution of Nurses Based on Their Attitude on Modified Neonatal Fall Risk Assessment Scale for Newborns**

## Summary

This chapter has dealt with the analysis and interpretation of the data obtained by the researcher. The analysis of the results showed that the nurses were compliant in using Modified Neonatal Fall Risk Assessment Scale for newborn. Thus the anticipated incidence of fall in newborn was prevented.

# CHAPTER V

# DISCUSSION

A Study to Assess the Nurses Compliance in Using Modified Neonatal Fall Risk Assessment Scale for Newborns in Selected Hospitals, Chennai.

## Objectives of the Study

1. To assess the compliance of nurses in using Modified Neonatal Fall Risk Assessment Scale.
2. To determine the incidence of fall after the implementation of Modified Neonatal Fall Risk Assessment Scale.
3. To find out the association between compliance of nurses in using Modified Neonatal Fall Risk Assessment Scale and selected demographic variables of nurses'.

## Demographic Variables Distribution

More than half of the nurses were aged 23 – 25 years, (53.3%), qualified with B.Sc (N) (98.3%), majority of them had not attended any in-service education on fall risk prevention or had undergone newborn related certified specialty training (86.6%).

It is evident from the above findings that the nurses who were using the fall risk assessment scale for newborns were young novice nurses. Hence, training provided to them would promote the fall risk prevention and provide quality care.

**Obstetrics Variable Distribution of Postnatal Mothers**

More than half of the mothers were aged 21 - 30 years (60%), Primipara (70%). Majority of mothers had a pain score of 4 – 7 on day 1, day 2 and day 3 (80%, 70%, 50 %). Majority of mothers (90%) got analgesics through intravenous route.

It was a felt need by the researcher that nurses need to be more aware of the maternal limitations, possible risk factors in the postnatal period. Hence this was a nursing concern towards postnatal mothers, to enable them understand the importance of fall prevention in newborn period and encourage them to follow preventive measures.

**The First Objective of the Study was to Assess the Compliance of Nurses Using Modified Neonatal Fall Risk Assessment Scale**

Newborn fall prevention is the primary responsibility of the nurse. Measures should be taken to improve the compliance of nurses as it is very essential. Considering its strong effect in preventing fall in newborns, Modified Neonatal Fall Risk Assessment Scale for newborn can be used by the nurses working in neonatal and maternity hospitals for preventing unintentional fall and its consequences.

The compliance of nurses who used modified neonatal fall risk assessment scale for newborns was found to higher on day 3 (80%) among the nurses working in labor ward, OT and postnatal ward and in NICU and nursery all the nurses (100%) were compliant on day 2 and 3.

Abike (2010) has published a study on a new scale for evaluating the risks for in- hospital falls in newborns from admission till discharge. The scale was prepared on the basis of the failure modes and effects analysis criteria .The authors confirmed that the scale increased the awareness and sensitivity to know the risks. They found that most risky situations for fall in newborns were when the mother was holding the baby while getting epidural analgesia and also during transportation of the baby after delivery.

**The Second Objective was to Determine the Incidence of Fall After the Implementation of Modified Neonatal Fall Risk Assessment Scale.**

The promotion of newborn safety is pivotal to all institutions that care for this population. Newborn falls are preventable injuries. The confounding variables involved in newborn falls are multifaceted. In order for newborns to remain safe, healthcare professionals must find a balance that supports nurturing, attachment, and bonding among caregivers and newborns along with the prevention of newborn falls. By utilizing existing evidence and expanding upon the current academic literature, researchers can begin to address this preventable injury (Wallace, 2015).

The present study findings revealed that there is no incidence of falls after implementation of Modified Neonatal Fall Risk Assessment Scale for Newborns. Thus we can conclude that the Modified Neonatal Fall Risk Assessment Tool is an effective tool to identify the risk factors and to prevent newborn fall.

Wallace (2015) said that evaluation by staff of why a newborn fall occurred is key to examining the incident and capturing ways to prevent future falls. This has been practiced in evaluating adult falls.

**The Third Objective was to Determine Association between Compliance of Nurses in Using Modified Neonatal Fall Risk Assessment Scale and Selected Demographic Variables of Nurses.**

Chi square test was used for finding out the association between the selected demographic variables and the compliance of nurses in using Modified Neonatal Fall Risk Assessment Scale, it showed no significant association between the nurses compliance and the selected demographic variables on day 1, 2, 3. Hence the null hypothesis $H_0$1; There will be no significant association between compliance of nurses using Modified Neonatal Fall Risk Assessment Scale and selected demographic variables of nurses was retained.

A recent study in the maternity wards at Nottingham university hospitals Trust by Helen Janiszewski (2015) reports17 baby falls in a 17 month period. Two of the babies who had fallen suffered injury. The author audited the incidents retrospectively using nurses' notes and found that most incidence was due to mothers restricted mobility, due to having had a caesarean section, fallen asleep with the baby in her arms, fallen from her arms onto the floor. She prepared a curtains risk assessment tool and provided appropriate cots with drop down side. This reduced the incidence of newborn falls.

## Summary

This chapter has discuss the various aspects of the study findings, emphasized the objectives of the study, major findings of the demographic and obstetric variables, incidence of newborn fall after implementation of newborn fall, Association between the Selected Demographic Variables and compliance of nurses in using Modified Neonatal Fall Risk Assessment Scale on day 1,2 and 3.

# CHAPTER VI

# SUMMARY, CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS

The aim of the study is to assess the compliance of nurses in using Modified Neonatal Fall Risk Assessment Scale for Newborns.

## Objectives of the Study

1. To assess the compliance of nurses in using Modified Neonatal Fall Risk Assessment Scale.
2. To determine the incidence of fall after the implementation of Modified Neonatal Fall Risk Assessment Scale.
3. To find out the association between compliance of nurses in using Modified Neonatal Fall Risk Assessment Scale and selected demographic variables of nurse's.

## Null Hypotheses

$H_0$1: There will be no significant association between compliance of nurses in using Modified Neonatal Fall Risk Assessment Scale and selected demographic variables of nurses.

The conceptual frame work for this study is based on Wiedenbach's Helping Art of Clinical Nursing Theory (1964). An extensive literature review and guidance by the experts formed foundations for the development of the tool. A Correlational research approach was used for achieving the objectives of the study

## The Major Findings of the Study

- ✓ More than half of the nurses were aged 23 – 25 years,(53.3%), qualified with B.Sc (N) (98.3%), majority of them had not attended any in-service education on fall risk prevention or had undergone newborn related certified specialty training (86.6%).
- ✓ More than half of the mothers were aged 21 - 30 years (60%), Primipara (70%). Majority of mothers had a pain score of 4 – 7 on day 1, day 2 and day 3 (80%, 70%, 50 %). Majority of mothers (90%) got analgesics through intravenous route.
- ✓ The compliance of nurses who used modified neonatal fall risk assessment scale for newborns was found to higher on day 3 (80%) among the nurses working in labor ward, OT and postnatal ward and in NICU and nursery all the nurses (100%) were compliant on day 2 and 3.
- ✓ The mean and standard deviation on the compliance of nurses taking care of the newborn was found to be higher on the third day of implementation of modified neonatal fall risk assessment scale for newborns (M =50.1 & SD = 7.68) in comparison with day 1 (M = 34.2 & SD = 9) and day 2 (M = 40 & SD = 7.53) for nurses in labor ward, OT and postnatal ward and it also depicts that for nurses working in NICU and nursery it was higher on day 3 (M = 29.1 & SD = 1.95 ) in comparison with day 1 (M = 23.3 & SD = 3.7) and day 2 (M = 28.2 & SD = 2.8).
- ✓ Findings reveal that there is no incidence of falls after implementation of Modified Neonatal Fall Risk Assessment Scale for Newborns.
- ✓ Chi square test was used for finding out the association between the selected demographic variables and the compliance of nurses in using Modified Neonatal Fall Risk Assessment Scale, it showed no significant association between the nurses compliance and the selected demographic variables on day1, 2, 3. Hence the null hypothesis $H_0$1; There will be no significant association between

compliance of nurses using Modified Neonatal Fall Risk Assessment Scale and selected demographic variables of nurses was retained.

## Conclusion

The conceptual framework for the study was developed on the basis of Wiedenbach's Helping Art of Clinical Nursing Theory (1964), which was modified for the present study. The study included 30 nurses who were selected using purposive sampling. The variables of the study were selected demographic variable and compliance of nurses. Null hypothesis was formulated.

An intensive review of literature and guidance from experts laid the foundation to the development of tools such as demographic variable proforma, obstetrical variable for postnatal mothers, nurses practice compliance check list, and nurses attitude rating scale. Validity was obtained from various experts and reliability was established.

The main study was conducted after the pilot study. Nurses' compliance was observed using practice checklist for three consecutive days for each nurse in all the shifts. The attitude of nurses towards the Modified Neonatal Fall Risk Assessment Scale was assessed after three days using an attitude scale. The data obtained was analyzed using descriptive and inferential statistics.

The findings of the study revealed that the nurses were compliant in using the Modified Neonatal Fall Risk Assessment Scale for newborns. Thus the incidence of fall in newborn was anticipated and appropriate preventive measures were taken.

# Nursing Implications

Based on the findings the researcher recommends the following steps in the field of nursing practice, nursing administration, nursing education, nursing research.

**Nursing Practice**

The findings of literature revealed that the risk for newborn to have accidental fall in hospital was underreported and studied, with more chance for newborns to have fall in hospital. It's is too important to study about the newborn fall and to implement evidence based practices in order to prevent unintentional injury to babies. With the above mentioned strategies Modified Fall Risk Assessment Scale is an effective tool to identify the risk of fall in newborns and to take appropriate preventive measures

Strategies/policies can be formed for the nurses to follow the modified Neonatal fall risk assessment tool and to create awareness among nurses and helps to have evidence based nursing practice.

**Nursing Education**

With the emerging health care demands and newer trends in the field of nursing education, the focus should be on the innovations to enhance nursing care. Nursing students should be taught the proper protocol. Therefore student nurses should be taught the clinical importance of identifying fall risk in newborns. Demonstration of a proper technique and preventive measures in the clinical setup helps the students in acquiring an adequate knowledge and incorporate it in their practice. It is of paramount importance that nurses possess the knowledge and skills in practicing Newborn care therefore nursing programs and hospitals must

make it a priority to educate both primipara mothers and nurses regarding evidence based Newborn care practices, support, and advice.

**Nursing Administration**

With technological advances and ever growing challenges facing health care, administrators have the responsibility to provide continuing nursing education opportunities to get awareness regarding fall risk in newborn and its preventive measures. This enables the nurses to update knowledge and to render cost effective care to the public. The nurse administrators should train nurses to identify risks factors in each newborn in different care settings. Nurse administrators should organize periodical formal training programmes for nurses for the demonstration and practice of preventive measures.

**Nursing Research**

Professionals and students can conduct further studies related to newborn fall risk in home care setting. There is a need for extensive research in this area. Nurse researcher should appraise challenges and should perform scientific work by taking part in assessment, applications, evaluation for newborns. The researcher can bring the researched technique into practice. Researchers should focus on developing an appropriate protocol for reducing the incidence of newborn fall and thus minimizing the complication.

## Recommendations

- A similar study could be undertaken on a larger scale for more valid generalization.
- Present study could be replicated in different settings.
- A comparative study could be done using different Neonatal fall risk assessment scales.
- The study can be conducted to find out the risk factors of newborn fall in the hospital.

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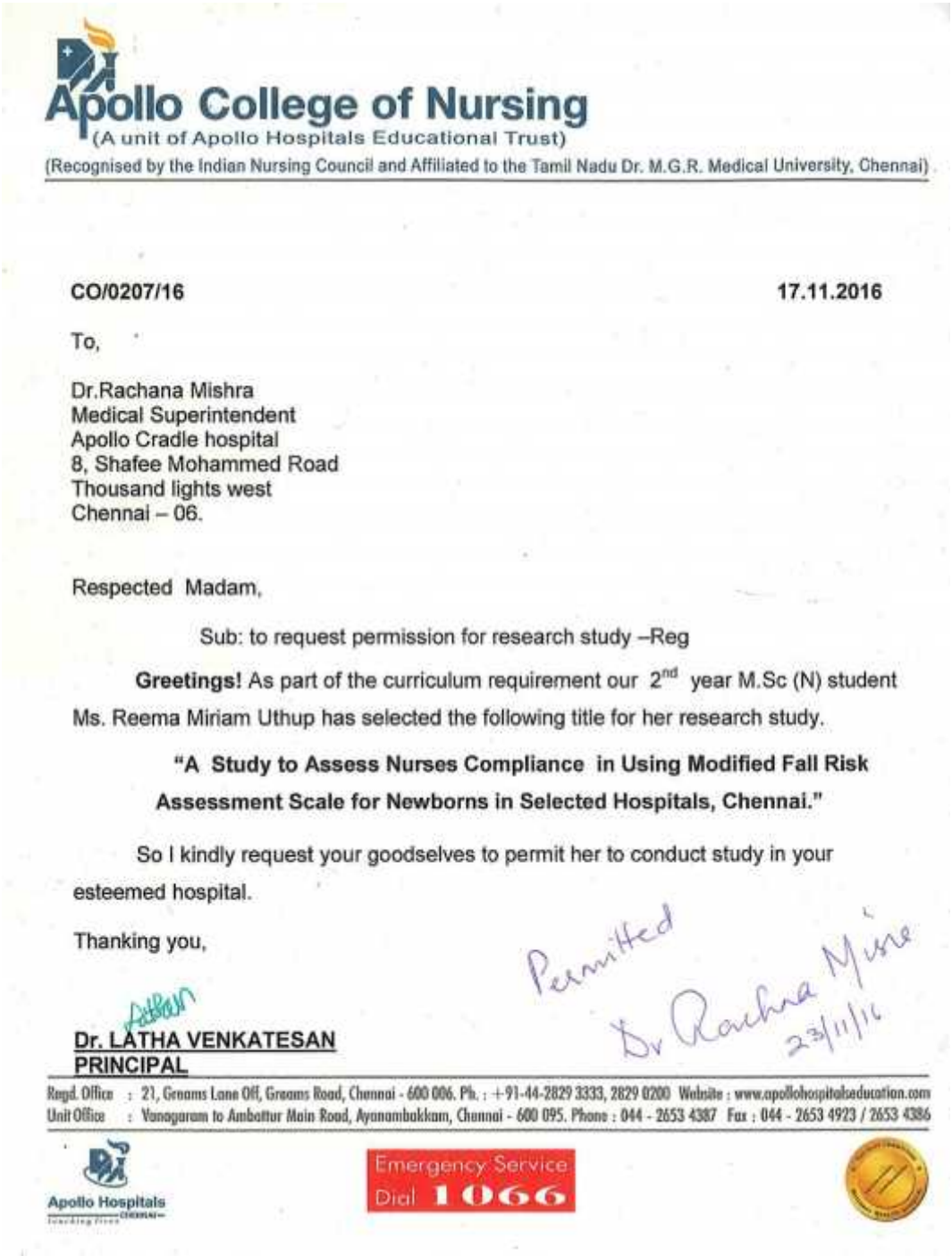
## APPENDIX I

## LETTER PERMITTING TO CONDUCT THE STUDY



Apollo College of Nursing
(A unit of Apollo Hospitals Educational Trust)
(Recognised by the Indian Nursing Council and Affiliated to the Tamil Nadu Dr. M.G.R. Medical University, Chennai)

CO/0207/16 17.11.2016

To,

Dr.Rachana Mishra
Medical Superintendent
Apollo Cradle hospital
8, Shafee Mohammed Road
Thousand lights west
Chennai – 06.

Respected Madam,

Sub: to request permission for research study –Reg

**Greetings!** As part of the curriculum requirement our 2nd year M.Sc (N) student Ms. Reema Miriam Uthup has selected the following title for her research study.

**"A Study to Assess Nurses Compliance in Using Modified Fall Risk Assessment Scale for Newborns in Selected Hospitals, Chennai."**

So I kindly request your goodselves to permit her to conduct study in your esteemed hospital.

Thanking you,

Permitted
Dr Rachna Mishra
23/11/16

**Dr. LATHA VENKATESAN**
**PRINCIPAL**

Regd. Office : 21, Greams Lane Off, Greams Road, Chennai - 600 006. Ph. : +91-44-2829 3333, 2829 0200 Website : www.apollohospitalseducation.com
Unit Office : Vanagaram to Ambattur Main Road, Ayanambakkam, Chennai - 600 095. Phone : 044 - 2653 4387 Fax : 044 - 2653 4923 / 2653 4386

Apollo Hospitals

Emergency Service
Dial 1066

## APPENDIX II

## ETHICS COMMITTEE CLEARANCE LETTER

**Institutional Ethics Committee - Clinical Studies**

**Reg.No.: ECR/37/Inst/TN/2013**

Apollo HOSPITALS TOUCHING LIVES

25 Nov 2016

To,
Ms. Reema Miriam Uthup,
First year, M.Sc. (Nursing),
Department of Child Health Nursing,
Apollo College of Nursing, Chennai.

**Ref:** A study to assess the Nurse's Compliance in using Modified Fall Risk Assessment Scale for newborns in selected hospitals, Chennai

**Sub**: Approval of the above referenced project and its related documents.

Dear Ms. Reema Miriam Uthup,

The Institutional Ethics Committee-Clinical Studies has received the following document submitted by you related to the conduct of the above-referenced study -

- Project Proposal
- Consent Form

The Institutional Ethics Committee-Clinical Studies reviewed and discussed the project proposal documents submitted by you at a meeting held on 22 November 2016.

The following Institutional Ethics Committee – Clinical Studies members were present at the meeting held on 22nd Nov 2016 at 3.30 PM at, Apollo Research & Innovations, Conference Hall, Room No: 19, 2nd Floor, Krishnadeep Chambers, (Apollo Hospitals, Annex No: 1), Wallace Garden, Chennai – 600006

| S. No | Name | Gender | Designation | Affiliation | Position in the committee |
|---|---|---|---|---|---|
| 1 | Dr. Rema Menon | F | Blood Bank Transfusion Services | Apollo Hospitals, Chennai | Member Secretary |
| 2 | Dr. Pradeep Kumar | M | Pharmacologist | Apollo Hospitals, Chennai | Pharmacologist |
| 3 | Ms. Maimoona Badsha | F | Lawyer | Independent legal Practitioner, Chennai | Lawyer |
| 4 | Mrs. Malathy Chandrasekhar | F | Home based teacher | Freelance | Layperson |
| 5 | Dr. K. Sathyamurthi | M | Asst. Professor | Madras School of Social work, Chennai | Social Scientist |

**Apollo Hospitals Enterprise Limited,**
21, Greams Lane, Off Greams Road, Chennai - 600 006, Tamil Nadu, India. Tel : +91-44-2829 5045 / 6641 Fax : +91-44-2829 4449
E-mail : ecapollochennai@gmail.com

## Institutional Ethics Committee - Clinical Studies

Reg.No.: ECR/37/Inst/TN/2013

Apollo HOSPITALS TOUCHING LIVES

The Institutional Ethics Committee-Clinical Studies reviewed the proposal, its methodology and design of the study. The proposed thesis work is approved in the presented form without any modifications.

The Institutional Ethics Committee-Clinical Studies review and approval of the report is only to meet their academic requirement and will not amount to any approval of the conclusion / recommendations as conclusive, deserving adoption and implementations, in any form, in any health care institution.

The Institutional Ethics Committee-Clinical Studies is constituted and works as per ICH-GCP, ICMR and revised Schedule Y guidelines.

Regards,

Date: 25/11/2016

**Dr. Rema Menon,**
Member Secretary,
Institutional Ethics Committee-Clinical Studies,
Apollo Hospitals,
Chennai.

MEMBER SECRETARY
INSTITUTIONAL ETHICS COMMITTEE CLINICAL STUDIES
APOLLO HOSPITALS, AHEL
CHENNAI, TAMILNADU.

**Apollo Hospitals Enterprise Limited,**
21, Greams Lane, Off Greams Road, Chennai - 600 006, Tamil Nadu, India. Tel : +91-44-2829 5045 / 6641 Fax : +91-44-2829 4449
E-mail : ecapollochennai@gmail.com

## APPENDIX III

## PLAGIARISM ORGINALITY REPORT

**Plagiarism Detector - Originality Report**

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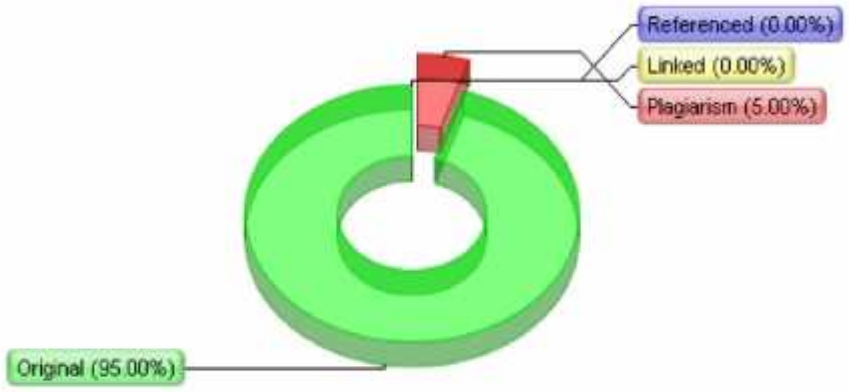


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**APPENDIX IV**

**REQUEST FOR CONTENT VALIDITY**

**LETTER REQUESTING OPINIONS AND SUGGESTIONS**

**OF EXPERTS FOR ESTABLISHING CONTENT VALIDITY**

**OF RESEARCH**

From

Ms. Reema Miriam Uthup

M.Sc., (Nursing) II Year,

Apollo College of Nursing,

Chennai-95.

To

Through Proper channel

Dr. Latha Venkatesan,

Principal,

Apollo College of Nursing.

**Sub: Request for opinions and suggestions of experts for content validity of Research tool-Reg**

Respected Sir/ Madam

Greetings! As a part of the Curriculum Requirement the following research title is selected for the study.

**"A Study to Assess the Nurse's Compliance in Using Modified Neonatal Fall Risk Assessment Scale for Newborns in Selected Hospitals, Chennai".**

I will be highly privileged to have your valuable suggestions with regard to content validity of research tool. So, I request you to validate my tool and give your valuable suggestions about the tool.

Thanking You,

Yours Sincerely,

(Ms.Reema Miriam Uthup)

## APPENDIX V

## LIST OF EXPERTS FOR CONTENT VALIDITY

**1. Dr.Latha Venkatesan, M.Sc(N).,M Phil., Ph.D(N)., M.BA(HM).,**

**Ph.D (HDFS).,**

Principal and professor

Apollo college of Nursing ,Chennai-95

**2. Dr.Latha Kanchi Parthasarathy, MBBS., DCH., MRCPCH., CCT (London)**

Neonatologist,

Apollo Childrens Hospital, Chennai-95.

**3. Ms. Asha Latha**

Nursing Officer,

Apollo Cradle Hospital, Chennai-95.

**4. Dr. Lizy Sonia A, M.Sc(N)., Ph.D(N).,**

Vice Principal,

Apollo college of Nursing , Chennai-95

**5. Dr. K. Vijayalakshmi, M.sc(N).,M.A. (Psy)., MBA., Ph.D(N)**

HOD of Mental Health Nursing ,

Apollo College of Nursing , Chennai -95.

**6. Prof. Nesa Sathya Satchi, M.sc (N).,**

HOD of Child Health Nursing

Apollo college of Nursing , Chennai – 95.

**7.Mrs.Jamuna Rani., M.Sc (N).,**

Reader,

Department of Child Health Nursing

Apollo college of Nursing , Chennai – 95.

**8.Mrs.Jenifer G**

Lecturer,

Department of Child Health Nursing

Apollo college of Nursing , Chennai – 95.

9. **Mrs. V. Dhanalakshmi, M. Sc., (N).,**

Reader,

Department of Obstetrics and Gynecological Nursing

Apollo College of Nursing, Chennai.

**10. Ms.Joselin Annabel P.C., M. Sc., (N).,**

Lecturer,

Department of Child Health Nursing

Apollo college of Nursing , Chennai – 95.

## APPENDIX VI

## CONTENT VALIDITY CERTIFICATE

I hereby certify that I have validated the research tool and interventional programme of Ms. Reema Miriam Uthup M.Sc (Nursing) II year student who is undertaking research study on "**A Study to Assess the Nurse's Compliance in Using Modified Neonatal Fall Risk Assessment Scale for Newborns in Selected Hospitals, Chennai".**

Signature of Expert

Name and designation

## APPENDIX VII

## RESEARCH PARTICIPANT CONSENT FORM

Dear Participant,

I am Reema Miriam Uthup, M.Sc(N) student of Apollo College of Nursing, Chennai. As part of my study, a research on **"A Study to Assess the Nurses' Compliance in Using Modified Neonatal Fall Risk Assessment Scale for Newborns in Selected Hospitals Chennai."** is selected to be conducted. The findings of the study will be helpful to prevent fall in newborns.

I hereby seek your consent and cooperation to participate in the study. Please be frank and honest in your responses. The information collected will be kept confidential and anonymity will be obtained.

Signature of investigator

I Ms. ----------hereby consent to participate in this study.

Place:

Date Signature of the participant

## APPENDIX VIII

## LETTER SEEKING PERMISSION TO MODIFY AND USE THE STUDY TOOL

| | |
|---|---|
| Subject: | Permission to modify and use the tool |
| From: | Reema Miriam |
| | Uthup(reemamiriamuthup@gmail.com) |
| To: | bilgi@bayindirhastanesi.com.tr |
| Date: | Sunday, 3 nov 2016 09:20 PM |

Dear Mr. Faruk abike,

With due respect I Ms.Reema Miriam Uthup Msc Nursing II year would like to state that as a part of my curriculum requirement I am planning to do a research entitled " A Study to Assess the Nurses Compliance in Using Modified Neonatal Fall Risk Assessment Scale for Newborns in Selected Hospitals, Chennai ". For the same I would like to modify and use Bayindir Hospital risk evaluation scale for in – hospital falls of newborn infants as one of my tool.(for academic purpose only).Please consider my request and grant me permission for the same.

Thanking you

## APPENDIX IX

## CERTIFICATE FOR ENGLISH EDITING

## TO WHOMSOVER IT MAY CONCERN

This is to certify that the dissertation **"A Study to Assess the Nurses' Compliance in Using Modified Fall Risk Assessment Scale for Newborns in Selected Hospitals, Chennai".**by Ms. Reema Miriam Uthup M.Sc. (Nursing) student Apollo College of Nursing was edited for English language appropriateness.

Prof. J.L. NARASIMHAN
New No.8, Second Main Road,
Block B - F1, Krishna Nagar,
Chromepet, Chennai-600 044.
Cell : 94446 54720
e-mail : profjln@yahoo.com

**Signature of Expert**

## APPENDIX X

## DEMOGRAPHIC VARIABLE PROFORMA OF NURSES

**Purpose**: This Proforma is used to measure the demographic variables of nurses such as age, education, experience and specialty training of nurses who are taking care of newborns

**Instruction**:

Please (✓) all appropriate options .Please be frank and free in answering the following questions.

**Sample no:**

1. Age in years ----------
2. Professional qualification
   - 2.1 ANM ☐
   - 2.2 Diploma in nursing ☐
   - 2.3 B.Sc (N) ☐
3. Institution trained
   - 3.1 Government ☐
   - 3.2 Private ☐
   - 3.3 Mission ☐
4. Total years experience as a qualified nurse----------months/yrs
5. Total years of experience in neonatal unit---------- months/yrs
6. Attended in service education regarding neonatal fall prevention
   - 6.1 Yes ☐
   - 6.2 No ☐

   If yes, specify----------
7. Undergone any newborn related certified specialty training
   - 7.1 Yes ☐
   - 7.2 No ☐

   If yes, specify----------

## APPENDIX XI

## OBSTETRICAL VARIABLE PROFORMA FOR POSTNATAL MOTHERS

**Purpose**: This Proforma is used to measure the Obstetrical variables of mothers of newborns such as age of the mothers in years, ordinal position of the child's birth, mode of delivery, pain score, type of analgesics used by mother, history of co-morbidity

**Instruction**: The investigator will collect the information by referring the files.

1. Age of the mother in years.
   - 1.1 Less than 20 ☐
   - 1.2 21 – 30 ☐
   - 1.3 31 – 40 ☐
   - 1.4 More than 40 ☐
2. Ordinal position of the child's birth
   - 2.1 One ☐
   - 2.2 Two ☐
   - 2.3 Three ☐
   - 2.4 Four ☐
3. Mode of delivery
   - 3.1 Normal ☐
   - 3.2Instrumental ☐
   - 3.3 Cesarean ☐
4. Pain score of mother on day1 …….
5. Pain score of mother on day2 …….
6. Pain score of mother on day3 …….

7. Type of analgesics used by mother

7.1 oral pills ☐

7.2 IV injections ☐

7.3 Patient controlled analgesia ☐

7.4 Epidural analgesia ☐

8. History of co-morbidity

8.1 Diabetes mellitus ☐

8.2 Convulsions ☐

8.3 Hypertension ☐

8.4 None ☐

8.5 Others ☐

**BLUE PRINT ON OBSERVATIONAL CHECK LIST TO ASSESS THE COMPLIANCE OF NURSES IN USING MODIFIED NEONATAL FALL RISK ASSESSMENT SCALE**

| S. No | Categories | Items | Total Items | Percentage |
|---|---|---|---|---|
| 1 | Newborn care<br>-Risk Factors<br>-Preventive Measures | 1, 2, 3, 6, 7, 8, 9, 10 | 8 | 47.05% |
| 2 | Mothers<br>-Risk Factors<br>-Preventive Measures | 4, 5, 11, 12, 13, 14, 15, 16, 17 | 9 | 52.9% |
| | Total | - | 17 | 100% |

## APPENDIX XII

## MODIFIED NEONATAL FALL RISK ASSESSMENT SCALE FOR NEWBORNS

**Purpose:** This is to estimate the fall risk score for newborns who are admitted in Apollo Cradle Hospital

**Instruction:** kindly tick yes for the risk factors which you anticipate in your assigned child and count the fall risk score according to your.

| S.NO | **Date:** | | **S1** | | **S2** | | **S3** | |
|---|---|---|---|---|---|---|---|---|
| | **Risk factors** | Score | y | n | y | n | y | n |
| 1. | Taking the baby out of the cot/incubator for any reason | 1 | | | | | | |
| 2. | Nutrition - breastfeeding | 1 | | | | | | |
| 3. | Bathing/baby care | 1 | | | | | | |
| 4. | Invasive interventions/examinations e.g.: taking blood samples | 1 | | | | | | |
| 5. | History of falling/dropping the baby by mother/caretaker | 1 | | | | | | |
| 6. | History of convulsions(of the mother and baby) | 1 | | | | | | |
| 7. | Invasive and non - invasive equipment connected to the baby(tubing's, urinary catheters, prosthesis) | 1 | | | | | | |
| 8. | Transport of the baby from one area to another | 3 | | | | | | |
| 9. | Pain score of the baby(>1) | 1 | | | | | | |
| 10. | Deterioration in the clinical status of the baby (restlessness, fever, sleep disorders, abdominal distension, feeding difficulty, vomiting) | 1 | | | | | | |
| 11. | Changes in clinical condition of mother(hypoglycemia, hypotension etc) | 1 | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 12. | Disabled (physically disabled) mother | 1 | | | | | | |
| 13. | Specific medication use in mother (sedatives, hypnotics etc) | 1 | | | | | | |
| 14. | Pain score of mother (>1) | 1 | | | | | | |
| 15. | Unawareness of mother or family members about fall risk of baby | 1 | | | | | | |
| 16. | Mother staying in hospital by herself | 1 | | | | | | |
| 17. | Mother who is given patient controlled analgesia (PCA, epidural anesthesia) | 4 | | | | | | |
| | TOTAL SCORE | | | | | | | |
| Signature of the assigned staff | | | | | | | | |

| | |
|---|---|
| <u>High risk >4 score</u><br>• Preventive measures are taken against the determined risk<br>• The mother is informed about the risk of falling<br>• The falling risk of the mother is evaluated by the adult fall scale<br>• Support of a second nurse is provided whenever the mother wants to hold the baby to breastfeed /care | <u>Low risk 1-3 scores</u><br>• Preventive measures are taken against the determined risk<br>• The mother is informed about the risks of falling<br>• The falling risk of the mother is evaluated by the adult fall scale |

Abbreviations: s1: shift 1, s2: shift 2, s3: shift 3, **y:** yes, **n:** no

**Note:** Follow the preventive measure for each risk factor

## Preventive measures

| s.no | Risk factors | Preventive measures |
|---|---|---|
| 1. | Taking the baby out of the cot/incubator for any reason | • The mother is informed about fall risk |
| 2. | Nutrition | • The floor of the mothers room is kept dry |
| 3. | Bathing /baby care | • Support of second person is provided<br>• The floor of baby care room is kept dry<br>• Bathing of baby is done in bathtub of baby care room |
| 4. | Invasive interventions/examinations, taking blood samples | • It is not allowed to handle the baby on during care /examination |
| 5. | History of falling / dropping the baby | • The mother and the caring team are informed about the fall history<br>• Preventive measures against the cause are taken |
| 6. | History of convulsions(of the mother and baby) | • The mother is informed<br>• She is not allowed to hold the baby by herself<br>• The mother is recommended to inform the health personnel when she feels a convulsion coming on |
| 7. | Invasive and non –invasive equipment connected to the baby(tubings,urinary catheters, prosthesis) | • A safe working environment is provided<br>• The falling risk that may be caused by the connected equipments is prevented |
| 8. | Transport of the baby<br>• Delivery bed to examination cot.<br>• Examination cot to incubator<br>• Incubator or baby crib to mothers bed/newborn bed<br>• Newborn cot to baby bath area | • The floor is inspected for dryness<br>• The safety of the equipment that will be used is checked before transport<br>• The baby should not be held in the arms. Baby should be transported in incubator or cot with wheel locking system.<br>• When the baby is transported from the cot /incubator to another place the cot /incubator is held close and at the same level with the bed /equipment<br>• When an elevator is used during the transport of the baby the height difference between the |

| | | |
|---|---|---|
| | | floors of the elevator and the flat should be checked(height difference may unbalance the cot, it may turn over and the baby can fall) |
| 9. | Pain score of mother (>1) | • Treatment is initiated according to the pain scores<br>• The side doors of the incubator should always be kept shut |
| 10. | Deterioration in the clinical status of the baby (restlessness, fever, sleep disorders, abdominal distention, feeding difficulty, vomiting) | • The doctor of the baby is informed<br>• The mother is informed about risks of falling |
| 11. | Changes in clinical condition(hypoglycemia, hypotension etc) | • The fall risk of mother is evaluated by adult fall risk scale<br>• The mother is not allowed to hold the baby by herself<br>• The mother is informed about the risks of falling |
| 12. | Disabled (physically disabled)mother, who is too young or too old | • The doctor of the baby is in formed<br>• The mother is informed of risk of falling |
| 13. | Specific medication use (sedatives, hypnotics etc) | • The mother is allowed to hold the baby in the supervision of the nurse<br>• The doctor of the baby is informed |
| 14. | Pain score of mother (>1) | • The mother is informed about risk of falling<br>• If the pain score is >4 mother is not allowed to hold the baby<br>• The doctor of the mother is informed |
| 15. | Unawareness of mother or family members about fall risk of baby | • The mother /accompanying person is re educated on the risk of falling(most of the falling incidents occur at night and at dawn) |
| 16. | Mother staying in hospital by herself | • The mother is informed to ask for nursing support whenever she breastfeeds/cares/holds the baby |
| 17. | Mother who is given patient controlled analgesia( PCA, epidural anesthesia) | • The mother is not allowed to move around by herself<br>• The mother is not allowed to hold the baby when she stands up alone<br>• Support of a second person(nurse, accompanying person)is provided when the mother wants to hold the baby to breastfeed/care |

**BLUE PRINT ON OBSERVATIONAL CHECK LIST TO ASSESS THE COMPLIANCE OF NURSES IN USING MODIFIED NEONATAL FALL RISK ASSESSMENT SCALE**

| S. No | Categories | Items | Total Items | Percentage |
|---|---|---|---|---|
| 1 | Newborn care<br>-Risk Factors<br>-Preventive Measures | 1, 2, 3, 6, 7, 8, 9, 10 | 8 | 47.05% |
| 2 | Mothers<br>-Risk Factors<br>-Preventive Measures | 4, 5, 11, 12, 13, 14, 15, 16, 17 | 9 | 52.9% |
| | Total | - | 17 | 100% |

**APPENDIX XIII**

**PRACTICE CHECKLIST FOR NURSES WHO ARE USING**

**THE MODIFIED NEONATAL FALL RISK ASSESSMENT SCALE**

**Purpose:** This checklist is used to assess the practice of nurses who are using the modified fall risk assessment scale.

Instruction: The investigator completes this checklist by direct observation of nursing care and from nurse's documentation in neonate's record

| | **DATE :** | | **SHIFT 1** | | | **SHIFT 2** | | | **SHIFT 3** | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | **C2** | **PC1** | **NC0** | **C2** | **PC1** | **NC0** | **C2** | **PC1** | **NC0** |
| **S.No** | **Risk factors** | **Preventive measures** | | | | | | | | | |
| 1. | Taking the baby out of the cot/incubator for any reason | • The mother is informed about fall risk<br>• The floor of the mothers room is kept dry | | | | | | | | | |
| 2. | Nutrition | | | | | | | | | | |
| 3. | Bathing /baby care | • The floor of baby care room is kept dry | | | | | | | | | |
| | | • Bathing of baby is done in bathtub of baby care room | | | | | | | | | |
| 4. | Invasive interventions/examinations, taking blood samples | • It is not allowed to hand the baby on during care /examination | | | | | | | | | |
| 5. | History of falling / dropping the baby | • The mother and the caring team are informed about the falling history | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | • Preventive measures against the cause are taken | | | | | | | | | |
| 6. | History of convulsions(of the mother and baby) | • The mother is informed | | | | | | | | | |
| | | • She is not allowed to hold the baby by herself | | | | | | | | | |
| | | • The mother is recommended to inform the health personnel when she feels a convulsion coming on | | | | | | | | | |
| 7. | Invasive and non –invasive equipment connected to the baby(tubing's, urinary catheters, prosthesis) | • A safe working environment is provided | | | | | | | | | |
| | | • The falling risk that may be caused by the connected equipments is prevented | | | | | | | | | |
| 8. | Transport of the baby<br>• Delivery bed to examination cot.<br>• Examination cot to incubator<br>• Incubator or baby crib to mothers bed/newborn bed<br>• Newborn cot to baby bath area | • The floor is inspected for dryness | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | • The safety of the equipment that will be used is checked before transport | | | | | | | | | |
| | | • The baby should not be hold in the arms /baby should be transported in incubator or cot with wheel locking system. | | | | | | | | | |
| | | • When the baby is transported from the cot /incubator to another place the cot /incubator is held close and at the same level with the bed /equipment | | | | | | | | | |
| | | • When an elevator is used during the transport of the baby the height difference between the floors of the elevator and the flat should be checked(height difference may<br>• unbalance the cot may turn over and the baby can fall) | | | | | | | | | |
| 9. | Pain score of baby (_>1) | • Treatment is initiated according to the pain scores | | | | | | | | | |
| | | • The side doors of the incubator should always be kept shut | | | | | | | | | |
| 10. | Deterioration in the clinical status of the baby (restlessness, fever, distention, sucking difficulty) | • The doctor of the baby is informed | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | • The mother is informed about risks of falling | | | | | | | | | |
| 11. | Changes in clinical condition(hypoglycemia, hypotension etc) | • The falling risk of mother is evaluated by adult fall risk scale | | | | | | | | | |
| | | • The mother is not allowed to hold the baby by herself | | | | | | | | | |
| | | • The mother is informed about the risks of falling | | | | | | | | | |
| 12. | Disabled (physically disabled)mother, who is too young or too old | • The doctor of the baby is in formed | | | | | | | | | |
| | | • The mother is informed of risk of falling | | | | | | | | | |
| 13. | Specific medication use (sedatives, hypnotics etc) | • The mother is allowed to hold the baby in the supervision of the nurse | | | | | | | | | |
| | | • The doctor of the baby is informed | | | | | | | | | |
| 14. | Pain score of mother (_>1) | • The mother is informed about risk of falling | | | | | | | | | |
| | | • If the pain score is >4 mother is not allowed to hold the baby | | | | | | | | | |
| | | • The doctor of the mother is informed | | | | | | | | | |
| 15. | Unawareness of mother or family members about fall risk | • The mother /accompanying person is re educated on the risk of falling(most of | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | of baby | the falling incidents occur at night and at dawn) | | | | | | | | | |
| 16. | Mother staying in hospital by herself | • The mother is informed to ask for nursing support whenever she breastfeeds/cares/holds the baby | | | | | | | | | |
| 17. | Mother who is given patient controlled analgesia( PCA, epidural anesthesia) | • The mother is not allowed to move around by herself | | | | | | | | | |
| | | • The mother is not allowed is not allowed to hold the baby when she stands up alone<br>• Support of a second person(nurse, accompanying person)is provided when the mother wants to hold the baby to breastfeed/care<br>• The doctor of the mother is informed | | | | | | | | | |
| | | | | | | | | | | | |

Scores

Compliant(C) - 2

Partially compliant (PC) - 1

Non compliant (NC) – 0

**SCORING KEY AND INTERPRETATION**

| **Score** | | | |
|---|---|---|---|
| **Labor ward, OT & Postnatal Ward** | **NICU & Nursery** | **Percentage** | **Level** |
| 0 - 33 | 0 – 16 | ≤50 % | Non compliant |
| 34 – 50 | 17 - 24 | 51 – 75 % | Partially compliant |
| 51 - 66 | 25 - 32 | 76 – 100% | Compliant |

**BLUE PRINT ON RATING SCALE ON ATTITUDE OF NURSES**

**IN USING FALL ASSESSMENT**

| S.No | Content | Items | Total Items | Percentage |
|---|---|---|---|---|
| 1. | Method applicability | 1,2,3,4,5,6,8 | 7 | 70% |
| 2. | Child benefit | 7,9,10 | 3 | 30% |
| **Total** | | **--** | **10** | **100%** |

## APPENDIX XIV

## SCALE TO ASSESS THE ATTITUDE OF NURSES TOWARDS MODIFIED NEONATAL FALL RISK ASSESSMENT SCALE

**Purpose:** This Likert scale is used to assess the attitude of nurses' towards Modified Neonatal Fall Risk Assessment Scale.

**Instruction:**

This Likert scale consists of 10 items out of which there are 5 negative statements and 5 positive statements. Each statement has got separate columns for strongly agree, agree, uncertain, disagree, strongly disagree. Nurses are asked to express their responses to the statements in the respective columns.

| S. No | ATITUDE ASSESSMENT STATEMENTS | SA | A | UNC | DA | SD |
|---|---|---|---|---|---|---|
| 1. | Fall risk assessment scale for newborns is simple | | | | | |
| 2. | Fall risk assessment scale for newborns needs to be more comprehensive | | | | | |
| 3. | Fall risk assessment scale for newborns is easy to document | | | | | |
| 4. | Fall risk assessment scale for newborns has repetitions of content | | | | | |
| 5. | Fall risk assessment scale for newborns is precise | | | | | |
| 6. | Fall risk assessment scale for newborns needs to be more organized | | | | | |
| 7. | Fall risk assessment scale for newborns minimizes newborn fall | | | | | |
| 8. | Fall risk assessment scale for newborns is time consuming | | | | | |
| 9. | Fall risk assessment scale for newborns is not applicable to all newborns | | | | | |
| 10. | Fall risk assessment scale for newborns can be applied for all newborns regardless of their health status | | | | | |

**KEY**

SA – strongly agree A – Agree

UNC – uncertain D – Disagree

SD – strongly disagree

**SCORING**

| Score | Percentage | Interpretation |
|---|---|---|
| <25 | < 50% | unfavorable attitude |
| 26 -37 | 51 – 75% | partially favorable attitude |
| 38 -50 | 76 – 100 | favorable attitude |

**Scoring key**

Assessment of attitude regarding Modified Fall Risk Assessment Scale for Newborns among nurses

| Item no | Nature of the item |
|---|---|
| 1,3,5,7,10 | Positive items |
| 2,4,6,8,9 | Negative items |

The response for each item was measured as a five point scale as follows:

| Options | Positive statements | Negative statements |
|---|---|---|
| Strongly agree | 5 | 1 |
| Agree | 4 | 2 |
| Uncertain | 3 | 3 |
| Disagree | 2 | 4 |
| Strongly disagree | 1 | 5 |

The maximum score is 50

## DEMOGRAPHIC VARIABLE PROFORMA

| Sample | AGE | PQ | IT | EQN | ENN | AIE | NRCC |
|---|---|---|---|---|---|---|---|
| 1 | 1.2 | 2.2 | 3.3 | 4.1 | 5.1 | 6.2 | 7.2 |
| 2 | 1.2 | 2.3 | 3.2 | 4.2 | 5.2 | 6.2 | 7.2 |
| 3 | 1.2 | 2.3 | 3.2 | 4.1 | 5.1 | 6.2 | 7.2 |
| 4 | 1.2 | 2.3 | 3.2 | 4.1 | 5.1 | 6.1 | 7.1 |
| 5 | 1.2 | 2.3 | 3.2 | 4.2 | 5.2 | 6.1 | 7.1 |
| 6 | 1.2 | 2.3 | 3.2 | 4.2 | 5.2 | 6.2 | 7.2 |
| 7 | 1.1 | 2.3 | 3.3 | 4.2 | 5.2 | 6.2 | 7.2 |
| 8 | 1.2 | 2.3 | 3.2 | 4.1 | 5.1 | 6.2 | 7.2 |
| 9 | 1.1 | 2.3 | 3.3 | 4.1 | 5.1 | 6.2 | 7.2 |
| 10 | 1.2 | 2.3 | 3.2 | 4.2 | 5.2 | 6.2 | 7.2 |
| 11 | 1.2 | 2.3 | 3.2 | 4.1 | 5.1 | 6.2 | 7.2 |
| 12 | 1.1 | 2.3 | 3.3 | 4.1 | 5.1 | 6.1 | 7.2 |
| 13 | 1.2 | 2.3 | 3.2 | 4.2 | 5.2 | 6.2 | 7.2 |
| 14 | 1.1 | 2.3 | 3.2 | 4.1 | 5.1 | 6.2 | 7.2 |
| 15 | 1.1 | 2.3 | 3.2 | 4.1 | 5.1 | 6.2 | 7.2 |
| 16 | 1.2 | 2.3 | 3.2 | 4.1 | 5.1 | 6.2 | 7.1 |
| 17 | 1.1 | 2.3 | 3.2 | 4.2 | 5.2 | 6.2 | 7.1 |
| 18 | 1.1 | 2.3 | 3.3 | 4.1 | 5.1 | 6.2 | 7.2 |
| 19 | 1.1 | 2.3 | 3.2 | 4.1 | 5.1 | 6.2 | 7.2 |
| 20 | 1.1 | 2.3 | 3.2 | 4.1 | 5.1 | 6.2 | 7.2 |
| 21 | 1.2 | 2.3 | 3.2 | 4.1 | 5.1 | 6.2 | 7.2 |
| 22 | 1.2 | 2.3 | 3.2 | 4.2 | 5.2 | 6.2 | 7.2 |
| 23 | 1.1 | 2.3 | 3.3 | 4.2 | 5.2 | 6.2 | 7.2 |
| 24 | 1.2 | 2.3 | 3.2 | 4.1 | 5.1 | 6.2 | 7.2 |
| 25 | 1.1 | 2.3 | 3.3 | 4.2 | 5.1 | 6.1 | 7.2 |
| 26 | 1.1 | 2.3 | 3.3 | 4.1 | 5.1 | 6.2 | 7.2 |
| 27 | 1.1 | 2.3 | 3.2 | 4.1 | 5.1 | 6.2 | 7.2 |
| 28 | 1.1 | 2.3 | 3.2 | 4.1 | 5.1 | 6.2 | 7.2 |
| 29 | 1.2 | 2.2 | 3.3 | 4.1 | 5.1 | 6.2 | 7.2 |
| 30 | 1.2 | 2.3 | 3.2 | 4.2 | 5.2 | 6.2 | 7.2 |

## CLINICAL VARIABLE PROFORMA

| Sample | AGE | OP | MOD | PS1 | PS2 | PS3 | AUM | HOC |
|---|---|---|---|---|---|---|---|---|
| 1 | 1.2 | 2.1 | 3.3 | 4.2 | 5.2 | 6.2 | 7.2 | 8.1 |
| 2 | 1.2 | 2.1 | 3.1 | 4.2 | 5.2 | 6.2 | 7.2 | 8.4 |
| 3 | 1.2 | 2.1 | 3.1 | 4.2 | 5.1 | 6.1 | 7.2 | 8.4 |
| 4 | 1.3 | 2.1 | 3.1 | 4.1 | 5.1 | 6.1 | 7.4 | 8.4 |
| 5 | 1.3 | 2.2 | 3.1 | 4.2 | 5.2 | 6.1 | 7.2 | 8.3 |
| 6 | 1.3 | 2.1 | 3.1 | 4.2 | 5.1 | 6.1 | 7.2 | 8.3 |
| 7 | 1.2 | 2.1 | 3.3 | 4.2 | 5.1 | 6.1 | 7.2 | 8.1 |
| 8 | 1.2 | 2.1 | 3.1 | 4.2 | 5.1 | 6.1 | 7.2 | 8.3 |
| 9 | 1.2 | 2.2 | 3.3 | 4.2 | 5.1 | 6.1 | 7.2 | 8.3 |
| 10 | 1.2 | 2.1 | 3.1 | 4.2 | 5.2 | 6.2 | 7.2 | 8.4 |

## APPENDIX XV

## DATA CODE SHEET

### DEMOGRAPHIC VARIABLE PROFORMA

**1.AGE - Age in years**

1.1≤ 22 years

1.2 23 - 25 years

1.3 26 – 28 years

1.4 ≥29 years

**2.PQ - Professional qualification**

2.1 ANM

2.2 Diploma in nursing

2.3 B.Sc (N)

**3. IT - Institution trained**

3.1 Government

3.2 Private

3.3 Mission

**4.EQN - Total years experience as a qualified nurse**

4.1≤ 1 year

4.2 2 – 3 year

4.3 4 – 5 year

4.3 ≥ 6 year

**5. ENN - Total years of experience in neonatal units**

5.1 ≤ 1 year

5.2 2 – 3 year

5.3 4 – 5 year

5.4 ≥ 6 year

**5 AIE - Attended in service education regarding neonatal fall prevention**

6.1 Yes

6.2 No

**6 NRCC - Undergone any newborn related certified specialty training**

7.1 Yes

7.2 No

## OBSTETRIC VARIABLE PROFORMA

**1. AGE – age in year**

1.1 ≤ 20 years

1.2 21 - 30 years

1.3 31 – 40 years

1.4 >40 years

**2. OP - Ordinal Position Of The Child's Birth**

2.1 One

2.2 Two

2.3 Three

2.4 Four

**3. MOD - Mode Of Delivery**

3.1 Normal

3.2 Instrumental

3.3 Cesarean

**4. PS1 - Pain Score Day 1**

4.1 0 – 3

4.2 4 – 7

4.3 8 – 10

**5. PS2 - Pain Score Day 2**

5.1 0 – 3

5.2 4– 7

5.3 8 – 10

**6. PS3 - Pain Score Day 3**

6.1 0 – 3

6.2 4 – 7

6.3 8– 10

**7. AUM - Type of Analgesics Used By Mother**

7.1 Oral pills

7.2 IV injections

7.3 patient controlled analgesia

7.4 epidural analgesia

**8. HOC - History of Co-morbidity**

8.1 Diabetes mellitus

8.2 Convulsions

8.3 Hypertension

8.4 None

8.5 Other

**APPENDIX XV**
**MASTER CODING SHEET**

| | SAMPLE | 1.1 | 2.1 | 3.1 | 3.2 | 3.3 | 4.1 | 5.1 | 5.2 | 6.1 | 6.2 | 6.3 | 7.1 | 7.2 | 8.1 | 8.2 | 8.3 | 8.4 | 8.5 | 9.1 | 9.2 | 10.1 | 10.2 | 11.1 | 11.2 | 11.3 | 12.1 | 12.2 | 13.1 | 13.2 | 14.1 | 14.2 | 14.3 | 15.1 | 16.1 | 17.1 | 17.2 | 17.3 | 17.4 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| day1 | 1 | 2 | 2 | 1 | 1 | 2 | | 0 | 0 | 0 | 0 | 0 | | | 2 | 1 | 2 | 1 | 2 | | | | | 2 | 2 | 2 | 0 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 | 2 | 2 | 2 | 0 | 24 |
| | 2 | 2 | 2 | 1 | 1 | 2 | | 0 | 0 | 0 | 0 | 0 | | | 2 | 1 | 2 | 2 | 2 | | | | | 2 | 2 | 2 | 0 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 | 2 | 2 | 2 | 0 | 41 |
| | 3 | 2 | 2 | 1 | 1 | 2 | | 0 | 0 | 0 | 0 | 0 | | | 2 | 1 | 2 | 1 | 2 | | | | | 2 | 2 | 2 | 0 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 | 2 | 2 | 2 | 0 | 40 |
| | 4 | 2 | | 0 | 0 | 0 | 2 | | | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | 26 |
| | 5 | 2 | | 0 | 0 | 0 | 2 | | | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | | | | | | | | | | | | | | | | | 24 |
| | 6 | 2 | | 2 | 2 | 2 | 2 | | | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | | | | | | | | | | | | | | | | | 30 |
| day 2 | 1 | 2 | 2 | 2 | 2 | 2 | | 0 | 2 | 0 | 0 | 0 | | | 2 | 2 | 2 | 2 | 2 | | | 0 | 0 | 2 | 1 | 1 | 0 | 0 | 2 | 2 | 2 | 0 | 0 | 2 | 1 | 0 | 2 | 2 | 0 | 39 |
| | 2 | 2 | 2 | 0 | 0 | 0 | | 0 | 2 | 0 | 0 | 0 | | | 2 | 2 | 2 | 2 | 2 | | | 0 | 0 | 2 | 2 | 1 | 0 | 0 | 2 | 2 | 1 | 0 | 0 | 1 | 2 | 0 | 1 | 2 | 0 | 32 |
| | 3 | 2 | 2 | 0 | 0 | 0 | | 0 | 2 | 0 | 0 | 0 | | | 2 | 2 | 2 | 2 | 2 | | | 0 | 0 | 2 | 2 | 2 | 0 | 0 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 0 | 34 |
| | 4 | 2 | 1 | 0 | 0 | 0 | 2 | | | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | 27 |
| | 5 | 2 | 1 | 0 | 0 | 0 | 2 | | | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | 26 |
| | 6 | 2 | 1 | 2 | 2 | 2 | 2 | | | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | 32 |
| day3 | 1 | 2 | 2 | 2 | 2 | 2 | | 0 | 0 | 0 | 0 | 0 | | | 2 | 2 | 2 | 2 | 2 | | | 0 | 0 | 2 | 2 | 2 | 0 | 0 | 2 | 2 | 1 | 0 | 0 | 2 | 1 | 2 | 1 | 1 | 0 | 38 |
| | 2 | 2 | 2 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | | 2 | 2 | 2 | 2 | 2 | | | 0 | 0 | 2 | 2 | 2 | 0 | 0 | 2 | 2 | 1 | 0 | 0 | 2 | 2 | 2 | 2 | 2 | 0 | 35 |
| | 3 | 2 | 2 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | | 2 | 2 | 2 | 2 | 2 | | | 0 | 0 | 2 | 2 | 2 | 0 | 0 | 2 | 2 | 1 | 0 | 0 | 2 | 2 | 2 | 2 | 2 | 0 | 35 |
| | 4 | 2 | 1 | 0 | 0 | 0 | 2 | | | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | 27 |
| | 5 | 2 | 1 | 0 | 0 | 0 | 2 | | | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | 27 |
| | 6 | 2 | 1 | 2 | 2 | 2 | 2 | | | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | 32 |
| day1 | 7 | 2 | 2 | 2 | 2 | 2 | | | 0 | 0 | 0 | 0 | | | 0 | 0 | 1 | 1 | 2 | | | | | 2 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 1 | 0 | 24 |
| | 8 | 2 | 2 | 2 | 2 | 2 | | | 0 | 0 | 0 | 0 | | | 0 | 0 | 1 | 1 | 2 | | | | | 2 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 1 | 0 | 24 |
| | 9 | 2 | 2 | 2 | 2 | 2 | | | 0 | 0 | 0 | 0 | | | 0 | 0 | 1 | 1 | 2 | | | | | 2 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 1 | 0 | 24 |
| | 10 | 2 | | 2 | 2 | 2 | 2 | | | | | | 2 | 0 | 2 | 0 | 1 | 0 | 2 | 0 | 2 | 1 | 1 | | | | | | | | | | | | | | | | | 21 |
| | 11 | 2 | | 2 | 2 | 2 | 2 | | | | | | 2 | 1 | 2 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 0 | | | | | | | | | | | | | | | | | 20 |
| | 12 | 2 | | 2 | 2 | 2 | 2 | | | | | | 2 | 1 | 2 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 0 | | | | | | | | | | | | | | | | | 20 |
| day 2 | 7 | 2 | 2 | 1 | 0 | 2 | 2 | 0 | 0 | 1 | 1 | 0 | | | 1 | 1 | 2 | 1 | 2 | | | | | 1 | 1 | 2 | 0 | 0 | 1 | 0 | 2 | 1 | 0 | 1 | 0 | 1 | 1 | 2 | 1 | 32 |
| | 8 | 2 | 2 | 1 | 0 | 2 | 2 | 0 | 0 | 1 | 1 | 0 | | | 2 | 2 | 2 | 1 | 1 | | | | | 1 | 1 | 2 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 1 | 0 | 2 | 2 | 2 | 0 | 33 |
| | 9 | 2 | 2 | 1 | 0 | 2 | 2 | 0 | 0 | 1 | 1 | 0 | | | 2 | 2 | 2 | 1 | 2 | | | | | 1 | 1 | 2 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 1 | 0 | 2 | 2 | 2 | 0 | 34 |
| | 10 | 2 | | 2 | 2 | 2 | 2 | | | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 0 | 0 | | | | | | | | | | | | | | | | | 27 |
| | 11 | 2 | | 2 | 2 | 2 | 2 | | | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | 32 |
| | 12 | 2 | | 2 | 2 | 2 | 2 | | | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | 32 |
| day3 | 7 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | | | 2 | 2 | 1 | 2 | 1 | | | | | 2 | 1 | 2 | 0 | 0 | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 51 |
| | 8 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 0 | | | 2 | 2 | 2 | 2 | 2 | | | | | 2 | 2 | 2 | 0 | 0 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 54 |
| | 9 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 0 | | | 2 | 2 | 2 | 2 | 2 | | | | | 2 | 2 | 2 | 0 | 0 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 2 | 2 | 54 |
| | 10 | 2 | | 2 | 2 | 2 | 1 | | | | | | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | | | | | | | | | | | | | | | | | 28 |
| | 11 | 2 | | 2 | 2 | 2 | 2 | | | | | | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 1 | | | | | | | | | | | | | | | | | 28 |
| | 12 | 2 | | 2 | 2 | 2 | 2 | | | | | | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | | | | | | | | | | | | | | | | | 26 |
| day1 | 13 | 2 | 1 | 2 | 1 | 2 | | 2 | 2 | 0 | 1 | 0 | | | 2 | 1 | 2 | 1 | 2 | | | 1 | 1 | 2 | 2 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 43 |
| | 14 | 2 | 1 | 1 | 1 | 2 | | 1 | 1 | 0 | 1 | 0 | | | 2 | 1 | 2 | 1 | 2 | | | 1 | 1 | 2 | 2 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 40 |
| | 15 | 2 | 1 | 1 | 1 | 2 | | 1 | 1 | 0 | 1 | 0 | | | 2 | 1 | 2 | 1 | 2 | | | 1 | 1 | 2 | 2 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 40 |
| | 16 | 2 | | 2 | 1 | 1 | 1 | 1 | 1 | | | | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | | | | | | | | | | | | | | | | | 28 |
| | 17 | 2 | | 2 | 1 | 1 | 2 | 2 | 2 | | | | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | | | | | | | | | | | | | | | | | 30 |
| | 18 | 2 | | 1 | 1 | 1 | 1 | 1 | 2 | | | | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | | | | | | | | | | | | | | | | | 25 |
| day 2 | 13 | 2 | 2 | 2 | 2 | 2 | | 1 | 1 | 1 | 2 | 1 | | | 2 | 1 | 2 | 2 | 2 | | | 0 | 0 | 2 | 1 | 2 | 0 | 1 | 2 | 0 | 0 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 46 |
| | 14 | 2 | 2 | 2 | 1 | 2 | | 1 | 1 | 1 | 2 | 1 | | | 1 | 1 | 2 | 2 | 2 | | | 0 | 0 | 2 | 2 | 2 | 0 | 1 | 1 | 0 | 0 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 44 |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 2 | 2 | 2 | 1 | 2 | | 1 | 1 | 1 | 2 | 1 | | | 1 | 1 | 1 | 2 | 2 | | | 0 | 0 | 2 | 1 | 2 | 0 | 1 | 1 | 0 | 0 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 42 |
| | 16 | 2 | | 2 | 2 | 2 | 2 | 2 | 2 | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | 31 |
| | 17 | 2 | | 2 | 2 | 2 | 2 | 1 | 2 | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | 30 |
| | 18 | 2 | | 2 | 2 | 2 | 2 | 1 | 2 | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | 32 |
| day3 | 13 | 2 | 2 | 2 | 2 | 2 | | 2 | 1 | 2 | 2 | 0 | | | 2 | 2 | 2 | 2 | 2 | | | 2 | 2 | 2 | 1 | 0 | 0 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 54 |
| | 14 | 2 | 2 | 2 | 2 | 2 | | 2 | 1 | 2 | 1 | 0 | | | 2 | 2 | 2 | 2 | 2 | | | 1 | 0 | 2 | 2 | 0 | 0 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 51 |
| | 15 | 2 | 2 | 2 | 2 | 2 | | 2 | 1 | 2 | 1 | 0 | | | 2 | 2 | 2 | 2 | 2 | | | 1 | 0 | 2 | 2 | 0 | 0 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 53 |
| | 16 | 2 | | 2 | 2 | 2 | 2 | 2 | 2 | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | 31 |
| | 17 | 2 | | 2 | 2 | 2 | 2 | 2 | 2 | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | 32 |
| | 18 | 2 | | 2 | 2 | 2 | 2 | 2 | 2 | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | 30 |
| day1 | 19 | 2 | 2 | 2 | 1 | 1 | | 1 | 0 | 0 | 1 | 0 | | | 2 | 2 | 2 | 1 | 2 | | | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 | 1 | 2 | 2 | 1 | 48 |
| | 20 | 2 | 2 | 1 | 1 | 1 | | 1 | 0 | 0 | 1 | 0 | | | 1 | 1 | 1 | 1 | 2 | | | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 35 |
| | 21 | 2 | 2 | 1 | 1 | 1 | | 1 | 0 | 0 | 1 | 0 | | | 1 | 1 | 1 | 1 | 2 | | | 2 | 1 | 2 | 1 | 2 | 0 | 0 | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 42 |
| | 22 | 2 | | 2 | 2 | 2 | | 2 | 2 | | | | 2 | 2 | 2 | 2 | 1 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | 24 |
| | 23 | 2 | | 2 | 2 | 2 | | 2 | 2 | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | | | 21 |
| | 24 | 2 | | 2 | 2 | 2 | | 2 | 2 | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | | | 20 |
| day 2 | 19 | 2 | 1 | 2 | 1 | 1 | | 2 | 1 | 2 | 2 | 1 | | | 2 | 1 | 2 | 2 | 2 | | | 1 | 1 | 2 | 2 | 1 | 0 | 2 | 2 | 0 | 2 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 51 |
| | 20 | 2 | 1 | 1 | 2 | 2 | | 2 | 2 | 2 | 2 | 1 | | | 2 | 2 | 1 | 2 | 2 | | | 1 | 1 | 2 | 2 | 1 | 0 | 2 | 2 | 0 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 52 |
| | 21 | 2 | 1 | 1 | 2 | 2 | | 2 | 2 | 2 | 2 | 1 | | | 2 | 2 | 1 | 2 | 2 | | | 1 | 1 | 2 | 2 | 2 | 0 | 2 | 2 | 0 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 53 |
| | 22 | 2 | 2 | 1 | 0 | 2 | | 0 | 0 | | | | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | 26 |
| | 23 | 2 | 2 | 1 | 0 | 2 | | 0 | 0 | | | | 2 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | | | | | | | | | | | | | | | | | | | | 25 |
| | 24 | 2 | 2 | 1 | 0 | 2 | | 0 | 0 | | | | 2 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | | | | | | | | | | | | | | | | | | | | 26 |
| day3 | 19 | 2 | 1 | 2 | 1 | 1 | | 2 | 2 | 2 | 2 | 1 | | | 2 | 2 | 2 | 2 | 2 | | | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 56 |
| | 20 | 2 | 1 | 1 | 2 | 2 | | 2 | 2 | 2 | 2 | 1 | | | 2 | 2 | 2 | 2 | 2 | | | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 60 |
| | 21 | 2 | 1 | 1 | 1 | 2 | | 2 | 2 | 2 | 2 | 1 | | | 2 | 2 | 2 | 2 | 2 | | | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 55 |
| | 22 | 2 | 2 | 2 | 2 | 2 | | 2 | 2 | | | | 1 | 2 | 0 | 0 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | 29 |
| | 23 | 2 | 2 | 2 | 2 | 2 | | 2 | 2 | | | | 1 | 2 | 0 | 0 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | 29 |
| | 24 | 2 | 2 | 2 | 2 | 2 | | 2 | 2 | | | | 1 | 2 | 0 | 0 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | 29 |
| day1 | 25 | 2 | 2 | 2 | 2 | 2 | | | 0 | 0 | 0 | 0 | | | 0 | 0 | 1 | 1 | 2 | | | | | 2 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 1 | 0 | 24 |
| | 26 | 2 | 2 | 2 | 2 | 2 | | | 0 | 0 | 0 | 0 | | | 0 | 0 | 1 | 1 | 2 | | | | | 2 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 1 | 0 | 24 |
| | 27 | 2 | 2 | 2 | 2 | 2 | | | 0 | 0 | 0 | 0 | | | 0 | 0 | 1 | 1 | 2 | | | | | 2 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 1 | 0 | 24 |
| | 28 | 2 | | 2 | 2 | 2 | 2 | | | | | | 2 | 0 | 2 | 0 | 1 | 0 | 2 | 0 | 2 | 1 | 1 | | | | | | | | | | | | | | | | | | | | 21 |
| | 29 | 2 | | 2 | 2 | 2 | 2 | | | | | | 2 | 1 | 2 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 0 | | | | | | | | | | | | | | | | | | | | 20 |
| | 30 | 2 | | 2 | 2 | 2 | 2 | | | | | | 2 | 1 | 2 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 0 | | | | | | | | | | | | | | | | | | | | 20 |
| day 2 | 25 | 2 | 2 | 2 | 2 | 2 | | 0 | 0 | 0 | 0 | 0 | | | 2 | 2 | 2 | 2 | 2 | | | 0 | 0 | 2 | 2 | 2 | 0 | 0 | 2 | 1 | 2 | 1 | 1 | 0 | 38 |
| | 26 | 2 | 2 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | | 2 | 2 | 2 | 2 | 2 | | | 0 | 0 | 2 | 2 | 2 | 0 | 0 | 2 | 2 | 1 | 0 | 0 | 2 | 2 | 2 | 2 | 0 | 35 |
| | 27 | 2 | 2 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | | 2 | 2 | 2 | 2 | 2 | | | 0 | 0 | 2 | 2 | 2 | 0 | 0 | 2 | 2 | 1 | 0 | 0 | 2 | 2 | 2 | 2 | 0 | 35 |
| | 28 | 2 | 2 | 1 | 0 | 2 | | 0 | 0 | | | | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | 26 |
| | 29 | 2 | 2 | 1 | 0 | 2 | | 0 | 0 | | | | 2 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | | | | | | | | | | | | | | | | | | | | 25 |
| | 30 | 2 | 2 | 1 | 0 | 2 | | 0 | 0 | | | | 2 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | | | | | | | | | | | | | | | | | | | | 26 |
| day3 | 25 | 2 | 1 | 2 | 1 | 1 | | 2 | 1 | 2 | 2 | 1 | | | 2 | 1 | 2 | 2 | 2 | | | 1 | 1 | 2 | 2 | 1 | 0 | 2 | 2 | 0 | 2 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 51 |
| | 26 | 2 | 1 | 1 | 2 | 2 | | 2 | 2 | 2 | 2 | 1 | | | 2 | 2 | 1 | 2 | 2 | | | 1 | 1 | 2 | 2 | 1 | 0 | 2 | 2 | 0 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 52 |
| | 27 | 2 | 1 | 1 | 2 | 2 | | 2 | 2 | 2 | 2 | 1 | | | 2 | 2 | 1 | 2 | 2 | | | 1 | 1 | 2 | 2 | 2 | 0 | 2 | 2 | 0 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 53 |
| | 28 | 2 | 1 | 0 | 0 | 0 | 2 | | | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | 27 |
| | 29 | 2 | 1 | 0 | 0 | 0 | 2 | | | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | 27 |
| | 30 | 2 | 1 | 2 | 2 | 2 | 2 | | | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | 32 |

## APPENDIX XV

## PHOTOGRAPH DURING OBSERVATION